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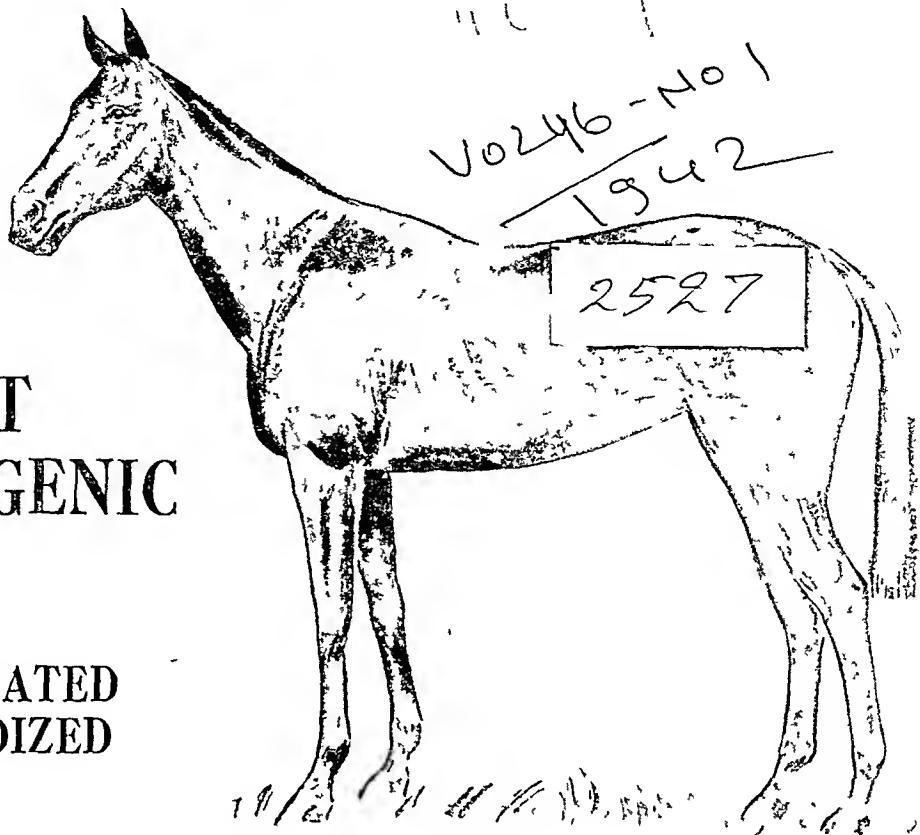
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# The Canadian Medical Association Journal

Editor, A. G. NICHOLLS, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C)  
3640 University Street, Montreal

Vol. 46

JANUARY, 1942

No. 1

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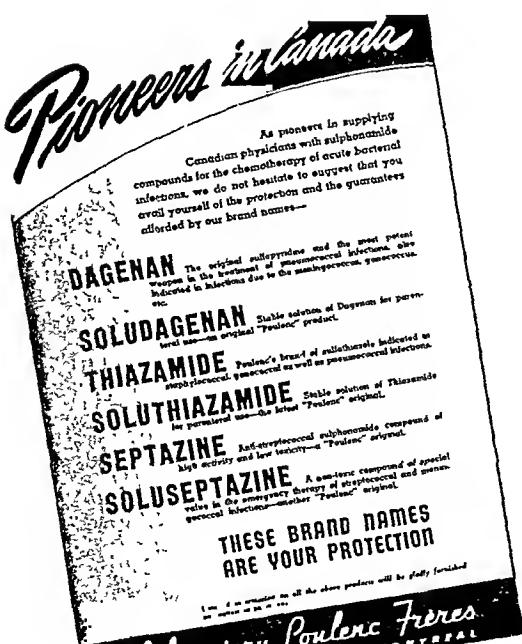
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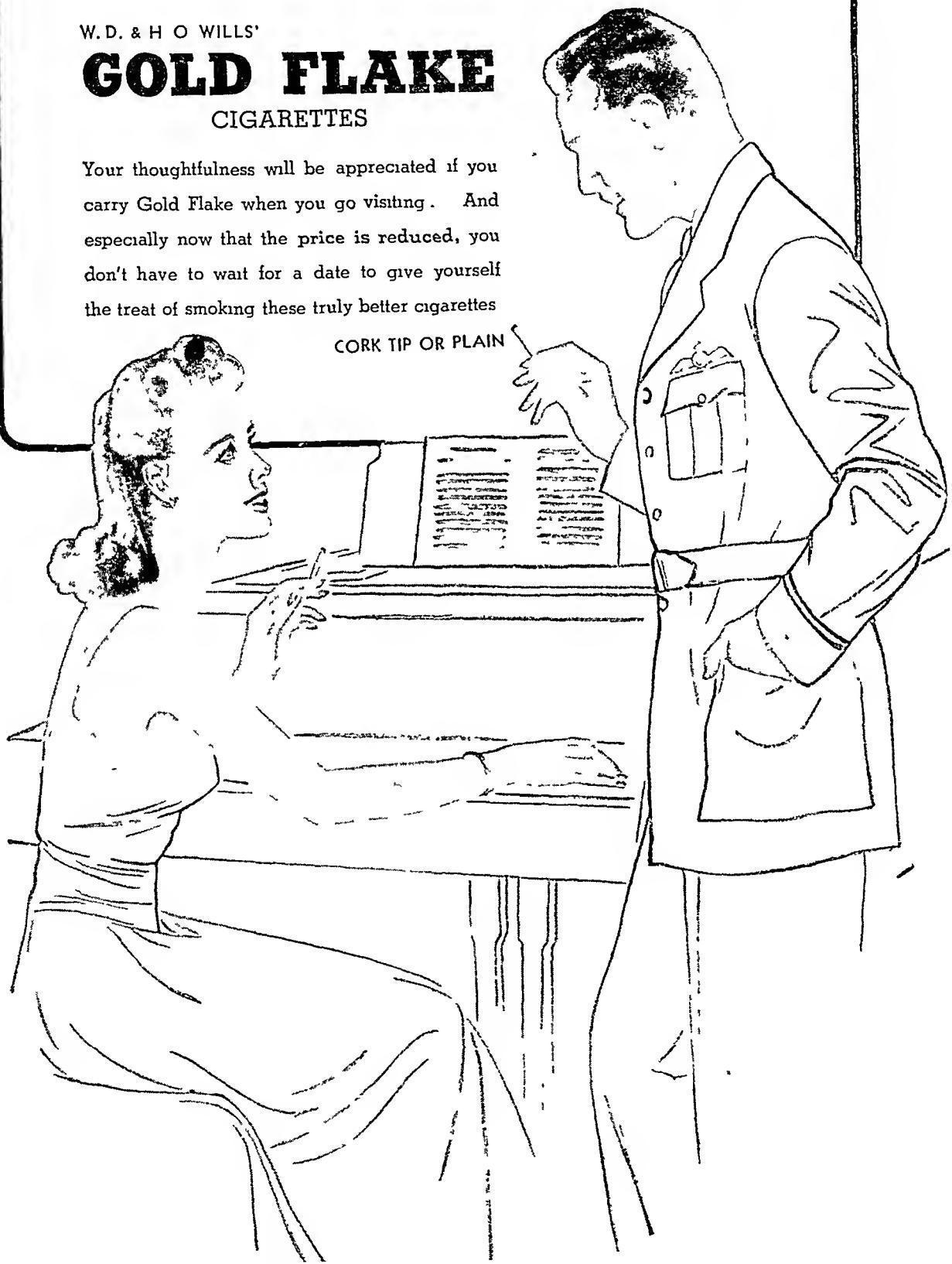
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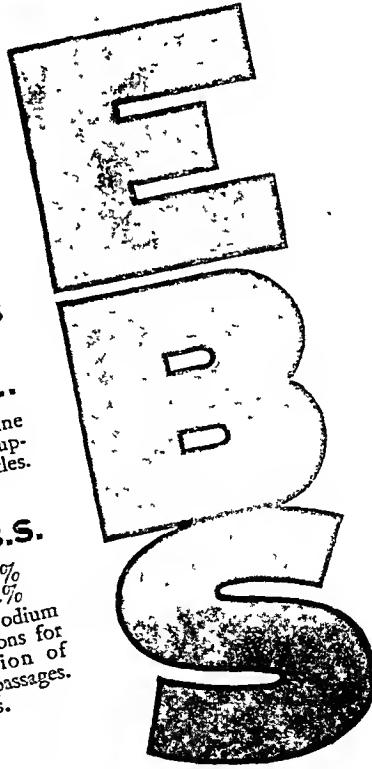
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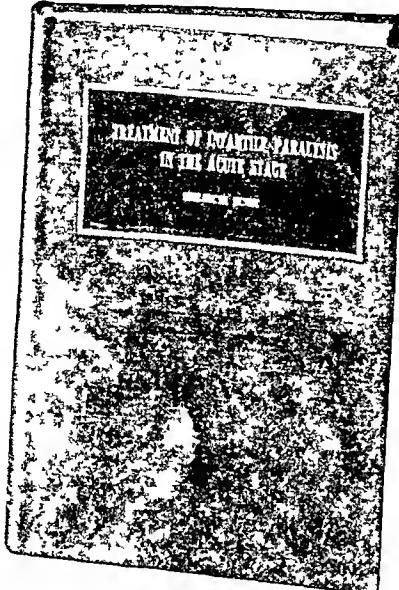
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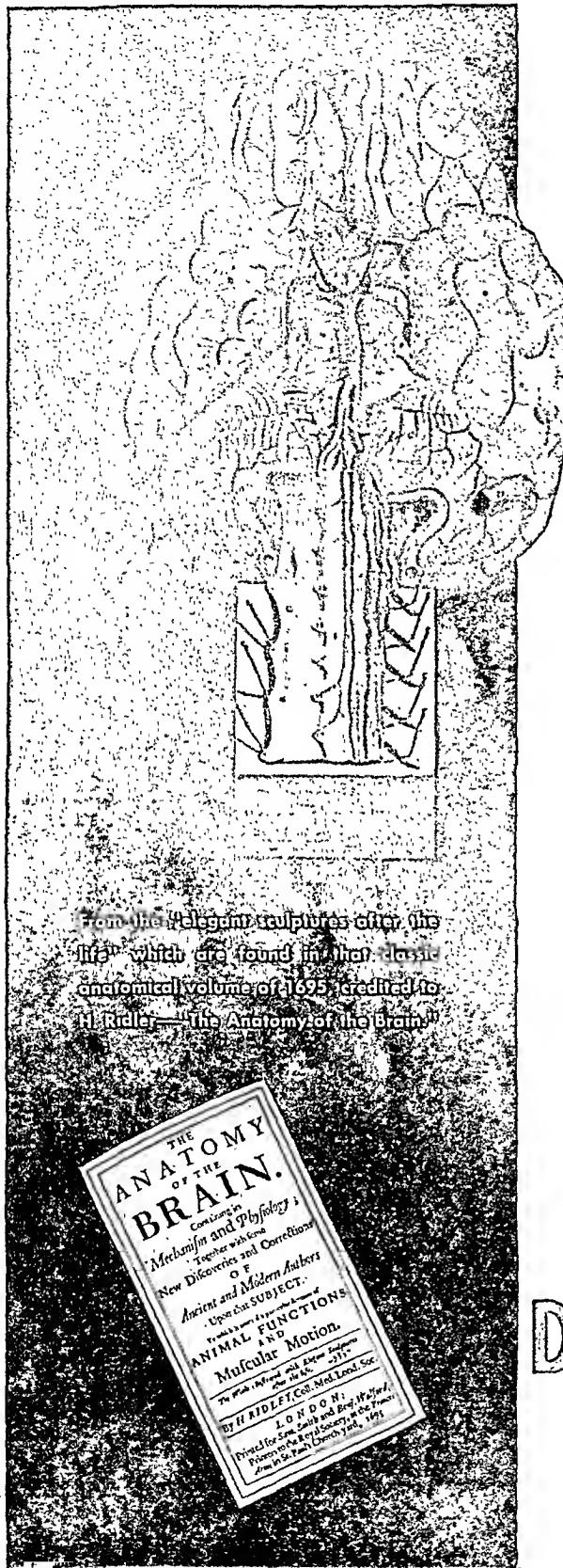
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1. Council Report: J.A.M.A., 113: 1734, 1939
2. Merritt, H. H. & Putnam, T. J.: A. J. Psychiat., 96: 1023, 1940

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  - (c) To enable the industry to co-operate more effectively in national planning by presenting to the Government through its appropriate medical, dental, veterinary, scientific and technical organizations the pooled knowledge and facilities acquired by the constituent companies in the field of therapeutic research.
4. The constituent founder Companies of the T.R.C. are:—
 

**BOOTS PURE DRUG COMPANY LTD.**  
**THE BRITISH DRUG HOUSES LTD.**  
**GLAXO LABORATORIES LTD.**  
**MAY & BAKER LTD.**  
**THE WELLCOME FOUNDATION LTD.**
- They will subscribe the capital of the Corporation as and when required in equal amounts.
5. The Board of the Corporation will consist of the Chairmen or Managing Directors of the constituent Companies.
6. Plans for research will be drawn up from time to time by a Research Panel consisting of the Heads of Research from each of the constituent Companies. This Panel will co-opt or consult with other scientific workers as and when special problems arise. Similarly arrangements for production will be made in due course by a Production Panel consisting of the Heads of Production of the constituent Companies.
7. Products evolved as a result of research sponsored by the Corporation will be marketed and sold by the constituent Companies under a common name. The T.R.C. will assist wherever practicable in simplifying the nomenclature of new medicinal substances.
8. The fundamental basis of these collaborative arrangements is *research* and the basic qualification for the inclusion of the above Companies in the Corporation is that each of them has been actively engaged for many years in the research, manufacture and distribution of products prescribed by the Medical, Dental and Veterinary Professions and sold by Pharmacists. Their research staffs in Great Britain include many eminent workers in the field of medical, chemical, physiological, bacteriological, veterinary, pharmaceutical and allied research as well as a number of qualified medical men and veterinary surgeons who are associated with these companies in whole-time research and advisory work. The contacts of the constituent Companies with scientific workers as well as their connections with other Companies in the Fine Chemical and Pharmaceutical Industries (either through subsidiaries, branches, agencies or working agreements with other firms) are world-wide.
9. The attitude of the Corporation is a co-operative one. It will, where desirable, negotiate agreements with other manufacturers of recognized standing.

The registered offices (pro tem.) of the Corporation are at: 183, EUSTON ROAD, LONDON, N.W.1

All communications should be addressed to the Secretary.

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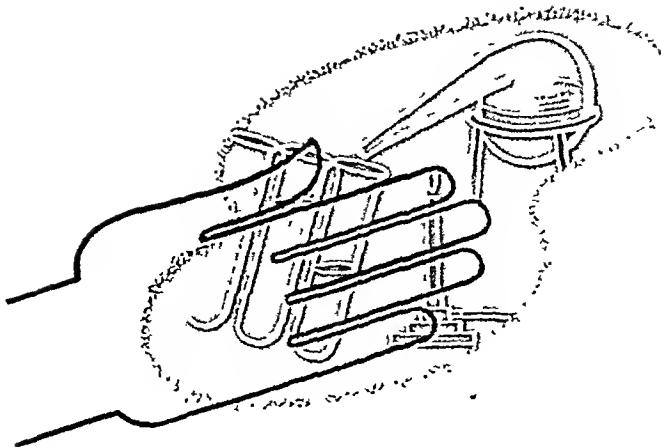
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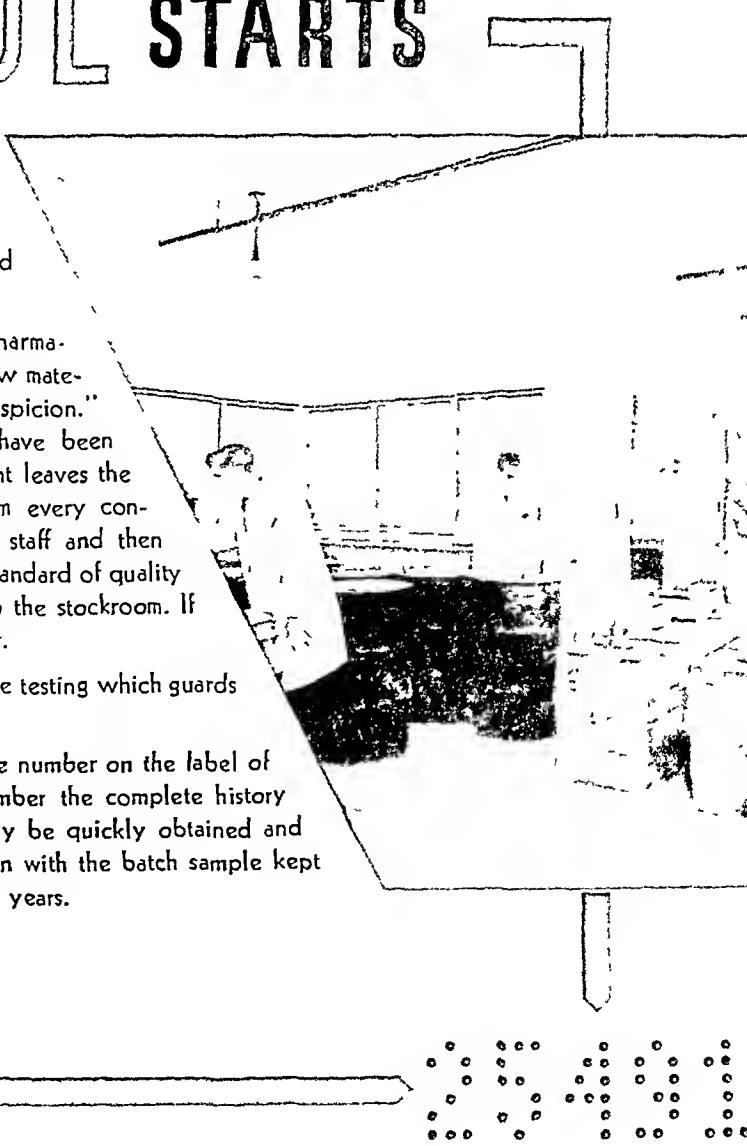
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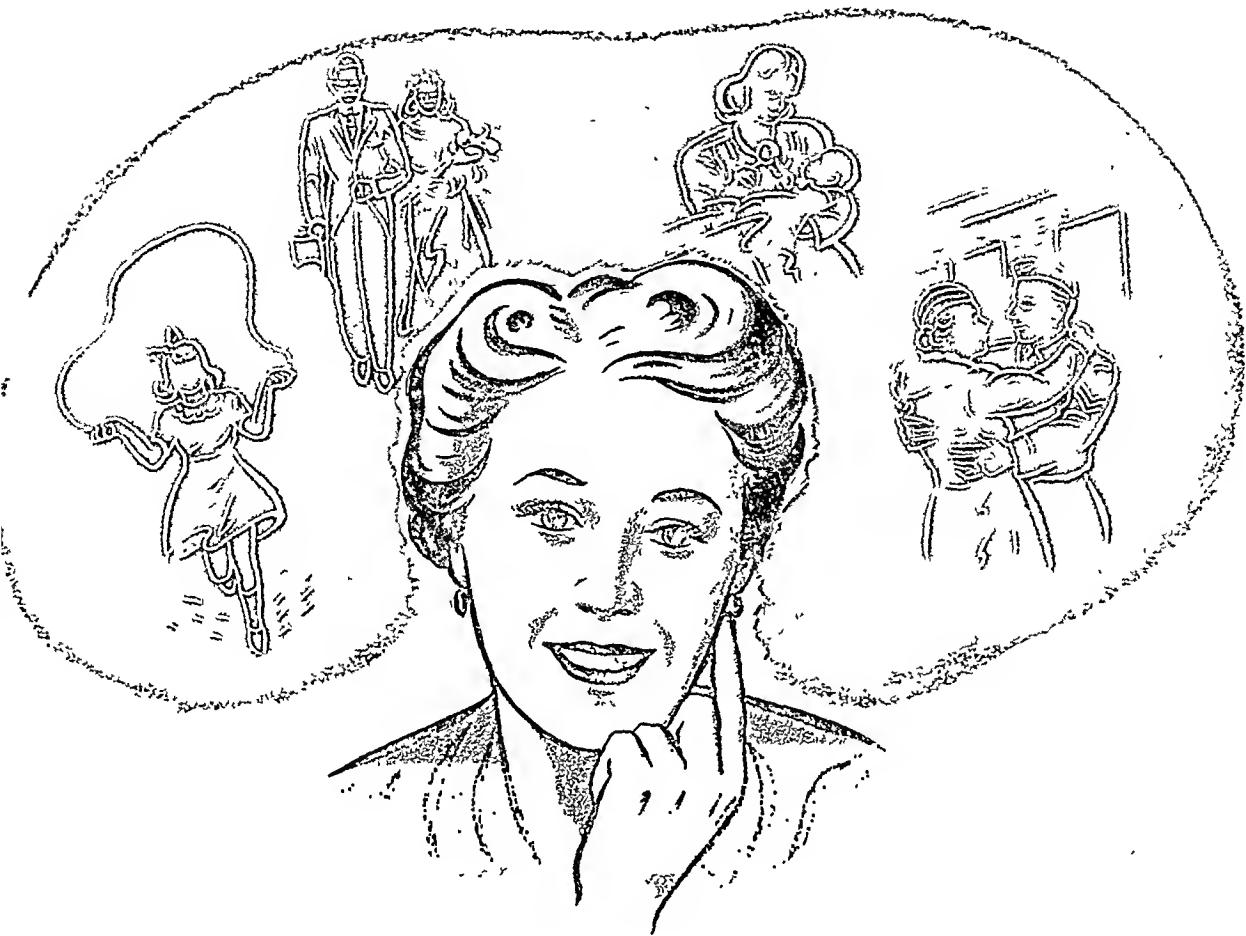
To say that the quality of the finished product can be no higher than the quality of its ingredients is to state the obvious. It is the obvious, however, that is sometimes overlooked—but not in the "Erosf" laboratories.

The first step in the manufacture of "Erosf" pharmaceuticals is to ensure that the quality of the raw materials shall be, like Caesar's wife, "above suspicion." No raw materials are accepted until they have been carefully assayed for quality. Before a shipment leaves the receiving room floor, samples are taken from every container by members of the control laboratory staff and then assayed. Only if they measure up to the high standard of quality required is the shipment accepted and sent to the stockroom. If not, it is rejected and returned to the supplier.

This is step number one in the system of multiple testing which guards the quality of "Erosf" products.

The key to this system of quality control is the number on the label of every "Erosf" pharmaceutical. Through this number the complete history of the particular tablets, powder or liquid may be quickly obtained and identity and quality established by comparison with the batch sample kept on file in the "Erosf" laboratories for at least 5 years.





Her early years—childhood, marriage, motherhood—are normally full and happy ones. Then comes middle age, with its difficult readjustments, physical and mental.

Oestrogen Therapy has helped to make these anxious middle years more serene and happy for many women. Now

# DIOESTROL

4:4' dihydroxy- $\alpha$ : $\beta$ -diethylstilbene

"Troost"

STILBOESTROL "Troost"



BRINGS THE BOON OF OESTROGEN THERAPY TO THOUSANDS WHO HAVE HITHERTO BEEN DENIED IT ON ACCOUNT OF COST.

Milligram for milligram Dioestrol is approximately 1/13 the cost of the naturally occurring Oestrogenic substances, of the latter "Ovasterol", synthesized in Canada, is the least expensive.



## ORALLY ACTIVE • PAREN UNIFORM POTENCY • MO

### *Indications and Use*

#### For the relief of the symptoms of the Menopause.

Dosage for this condition varies over a wide range and must be individualized. 0.2 milligrams Dioestrol daily appears to include the effective range for most individuals. The daily requirement should be divided into 2 or 3 doses. Alternatively 0.25 to 5.0 milligrams Dioestrol may be injected subcutaneously twice weekly.

#### Suppression of Lactation.

2.0 to 5.0 milligrams Dioestrol daily for 4 to 6 days post-partum. The total daily dose should be divided into 2 or 3 parts.

#### Involutionary Melancholia.

The use of Dioestrol for this condition has not as yet been reported upon. On the basis of the dosage which has been recommended for oestradiol, 1 to 5 mgs. may be injected twice weekly. As improvement occurs, oral administration of 1 to 5 mgs. daily may be instituted.

#### Functional Uterine Bleeding.

5 mgs. intramuscularly.

### "DIOESTROL"

4:4' dihydroxy - α:β - diethylstilbene

A new synthetic oestrogenic substance reproducing the physiological effects of the naturally occurring estrogens—oestradiol, oestrone, and oestriol.

Dihydro-diethyl-stilboestrol ("Dioestrol-DH" *Staub*) was favourably reported on by the Therapeutic Trials Committee of the Medical Research Council (Lancet 1940, 1, 629). The

#### Senile V.

Oral admin  
alternatively  
may be used

#### Kraurosis

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When the Naturally Occurring oestrogen  
is preferred

### "OVASTEROL"

The true female sex hormone in  
Crystalline Form

Synonyms:  
(dihydroxyestrin, oestradiol, dihydro-folliculine)

#### For the relief of the symptoms of the Menopause

Dosage in these conditions varies over a very wide range and depends altogether on the response of the patient. Initially Ovasterol *Staub* by mouth 1,000 to 2,000 International Units (1 or 2 tablets daily) increasing to 10,000 units (10 tablets daily) as necessary. Alternatively intramuscular injections of 1,000 to 10,000 International Units twice weekly may be given. As improvement occurs the dose may be reduced. The maintenance dose may be as low as 1,000 units orally (one tablet) on alternate days.

#### Involutionary Melancholia

1,000 to 10,000 International Units by intramuscular injection twice weekly. As improvement occurs the dose may be reduced to 1,000 or 2,000 units orally on alternate days.

#### Senile Vaginitis and Kraurosis of the Vulva

1,000 to 10,000 units daily, orally or intramuscularly, until improvement occurs after which a maintenance dose of 1,000 or 2,000 units orally on alternate days may be found to be adequate. Note:—"Ovasterol" is the only Canadian-made Oestradiol.

#### Amenorrhoea, Hypomenorrhoea and Dysmenorrhoea

Dosage initially must be quite large, 10,000 to 50,000 units intramuscularly every third or fourth day for 2 or 3 weeks of each month. Several such courses may be found necessary to correct the underlying condition. A fair percentage of patients appear to respond satisfactorily to this form of treatment.

#### Gonorrhoeal Vulvovaginitis

1,000 International Units intramuscularly on alternate days for a period of about 8 weeks.

### *Modes of Issue*

#### "OVASTEROL" TABLETS

C.T. No. 318 <i>Staub</i>	- - - - -	1,000 Int. units (0.1 mg.)
C.T. No. 325 <i>Staub</i>	- - - - -	10,000 Int. units (1.0 mg.)

Tubes of 25 tablets

#### "OVASTEROL" AMPOULES

Oestradiol Benzoate in oil

Ampoule No. 522 <i>Staub</i>	- - - - -	1,000 Int. units (0.1 mg.)
Ampoule No. 523 <i>Staub</i>	- - - - -	10,000 Int. units (1.0 mg.)
	Boxes of 6 ampoules, 1 cc. size	
Ampoule No. 524 <i>Staub</i>	- - - - -	50,000 Int. units (5.0 mg.)

Boxes of 1 ampoule, 1 cc. size

### "DIOESTROL-DH."

(Enteric coated)

4:4' dihydroxy - α:β - (dihydro) diethylstilbene

Henoestrol *Staub*

Please refer to "Dioestrol" for Indications and Dosage

### *Modes of issue*

#### "DIOESTROL-DH." TABLETS

ECT. No. 415 <i>Staub</i>	- - - - -	0.1 mg.
ECT. No. 416 <i>Staub</i>	- - - - -	0.25 mg.
ECT. No. 417 <i>Staub</i>	- - - - -	0.5 mg.
ECT. No. 418 <i>Staub</i>	- - - - -	1.0 mg.

#### "DIOESTROL-DH." AMPOULES

dissolved in oil

Ampoule No. 548 <i>Staub</i>	- - - - -	0.25 mg.
Ampoule No. 549 <i>Staub</i>	- - - - -	1.0 mg.
	Boxes of 6 and 25 ampoules	

Ampoule No. 550 <i>Staub</i>	- - - - -	5.0 mg.
	Boxes of 6 ampoules	

The Canadian Mark of Quality



WHEN THE NATURALLY OCCURRING OESTROGEN IS PREFERRED

# "OVASTEROL"

THE TRUE FEMALE SEX HORMONE IN CRYSTALLINE FORM

## ○ FOR THE RELIEF OF THE SYMPTOMS OF THE MENOPAUSE

Dosage in these conditions varies over a very wide range and depends altogether on the response of the patient. Initially Ovasterol "Frost" by mouth 1,000 to 2,000 International Units (1 or 2 tablets daily) increasing to 10,000 units (10 tablets daily) as necessary. Alternatively intramuscular injections of 1,000 to 10,000 International Units twice weekly may be given. As improvement occurs the dose may be reduced. The maintenance dose may be as low as 1,000 units orally (one tablet) on alternate days.

## ○ INVOLUTIONARY MELANCHOLIA

1,000 to 10,000 International Units by intramuscular injection twice weekly. As improvement occurs the dose may be reduced to 1,000 or 2,000 units orally on alternate days.

## ○ SENILE VAGINITIS AND KRAUROSIS OF THE VULVA

1,000 to 10,000 units daily orally or intramuscularly until improvement occurs after which a maintenance dose of 1,000 or 2,000 units orally on alternate days may be found to be adequate. Note:—"Ovasterol" is the only Canadian-made Oestradiol.

## ○ AMENORRHOEA, HYPOMENORRHOEA AND DYSMENORRHOEA

Dosage initially must be quite large, 10,000 to 50,000 units intramuscularly every third or fourth day for 2 or 3 weeks of each month. Several such courses may be found necessary to correct the underlying condition. A fair percentage of patients appear to respond satisfactorily to this form of treatment.

## ○ GONORRHOEAL VULVOVAGINITIS

1,000 International Units intramuscularly on alternate days for a period of about 8 weeks.

Frost

## A new Vi-Delta Vitamin Product—

### VI-DELTA MULTI-VITAMINS (Capsules)

*Lederle*

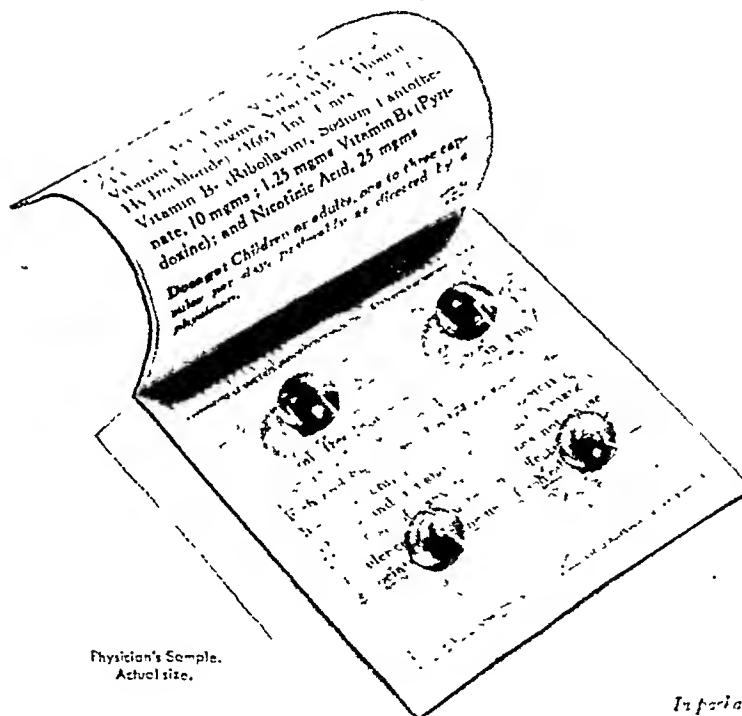
Vitamins A, B, C and D

A valuable supplement  
to the vitamin-deficient diet

"VI-DELTA MULTI-VITAMINS *Lederle*" have been developed to meet the needs of the physician in the many cases where it is desirable to supplement the diet with Vitamins A, B Complex, C and D.

The advantages of providing generous unitage of each of these important vitamins in a single, convenient capsule are readily apparent, both on the score of facilitating the patient's compliance with the physicians' instructions, and as a means of assuring consistently uniform dosage.

EACH VI-DELTA MULTI-VITAMIN CAPSULE (0.2 grain) contains 8 vitamins:



VITAMIN A—5000 U. S. P. XI Units (Int. Units)
VITAMIN B <sub>1</sub> (Thiamine Hydrochloride)—1 mg
VITAMIN B <sub>2</sub> (Riboflavin)—1 mg
VITAMIN B <sub>6</sub> (Pyridoxine)—0.25 mg
NICOTINIC ACID—5 mg
SODIUM PYROPHOSPHATE—2 mg
VITAMIN C (Ascorbic Acid)—25 mg
VITAMIN D—500 U. S. P. XI Units (Int. Units)

The vitamin A and D concentrate used in this product is obtained from the liver oils of Tuna fish and Shark, so blended as to provide high uniform content of Vitamins A and D. A palatable product results that is remarkably free of fishy taste—no flatulence and eructations commonly associated with the use of fish oil products.

In packages of 25, 50 and 100 caps. doses.

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# PYRIDIUM

Reg. U. S. Pat. Off.

*for the Chemotherapy of  
Common Uropathies*

*Left—enlarged urethroscopic view of normal prostatic urethra showing verumontanum.*

*Right—chronic inflammation.*



Another important contribution has been added to the published reports on the effectiveness of Pyridium for prompt symptomatic relief in common urogenital infections. Morrissey and Spinelli\* state:

"In the cases of prostatic hypertrophy it was observed that urinary frequency by day and night was markedly diminished in those cases showing a residual not above 5 ounces. The associated cystitis commonly observed in these cases of hypertrophy was noted to be improved from the standpoint of pain and discomfort. Following cystoscopic diagnostic procedures in all of these patients—pyelography, urethral and ureteral dilatation—the usual need for opium or other analgesics was absent, these cases all having been given pyridium prior to cystoscopy."

**PYRIDIUM**

TRADE MARK

(Phenylaza-Alpha-Alpha-Diamino  
Pyridine Mono-Hydrochloride)

A decade of service  
in urogenital  
infections

\*An experimental study of the anesthetic and analgesic properties of pyridium, J. Urol. 44: 381-385, Sept. 1940.

# 88.1% "GOOD RESULTS" Reported by Doctors Using **SUPERTAH OINTMENT** in Eczema Therapy



7.6% NOT  
GOOD RESULTS



4.3% DID  
NOT REPORT



In a recent survey of 9,672 physicians chosen proportionate to population throughout the country, 70.7% of those responding reported using SUPERTAH Ointment (Nason's) in eczema therapy.

It is significant that 88.1% of that number reported securing "good results" from their use of SUPERTAH! — the new white, non-staining ointment prepared from a crude coal tar concentrate and uniformly milled in 5% and 10% strengths. 4.3% did not respond either way, 7.6% reported

not having secured good results.

These reports of physicians vigorously confirm the clinical findings of the dermatologist, J. H. Swartz, M.D., and his co-worker, M. G. Reilly, R.N., who say of SUPERTAH Ointment: "It has proven as valuable as the black coal tar preparation and the advantage of the diminution of the black color is perfectly obvious. It does not stain the skin or clothing, nor does it burn or irritate the skin."\*

SUPERTAH Ointment (Nason's) is packaged in original 2 oz. jars, either 5% or 10% strengths, and ethically distributed through leading prescription druggists.

\*Swartz & Reilly, "Diagnosis and Treatment of Skin Diseases," p. 65

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## Girth-control clinic



Every physician knows these "experts": the women—and men!—whose infallible dietary formulae for taking off unwanted pounds are all too frequently the cause of serious, though usually subclinical, vitamin deficiency. He knows, too, that weight reduction schemes are only one of the numerous common causes of inadequate vitamin intake . . . knows that food fads, ignorance, carelessness, personal dislikes, hasty eating and insufficient appetite are all contributing factors. Today, he realizes, more than ever before, the frequent need for *dependable vitamin supplements*. Abbott Vitamin Products are just that—*dependable!* And there's a preparation to meet almost every common vitamin need. Many physicians specify *Abbott* routinely . . . Why not you? ABBOTT LABORATORIES LTD., 20 Bates Road, Montreal.

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# The Canadian Medical Association Journal

Vol. 46

TORONTO, JANUARY, 1942

No. 1

## NUTRITION IN PREGNANCY

By J. HARRY EBBS, M.D.,\* W. A. SCOTT, M.B., M.R.C.O.G., F.R.C.S.(C),†  
F. F. TISDALE, M.D., F.R.C.P.(C),\* WINIFRED J. MOYLE, B.Sc.‡ AND MARJORIE BELL, B.Sc.§

Toronto

THE maternal mortality rate in Canada has been gradually reduced in the last 14 years, from 5.7 per 1,000 live births in 1926, to 4.0 per 1,000 live births in 1940. The preliminary Annual Report, Vital Statistics of Canada, 1940,<sup>1</sup> contains the following facts:

Total births, 1940: born alive 243,835; stillborn 6,605.  
Maternal deaths, Canada, 1940, 973.  
Maternal mortality rate, 4.0 per 1,000 live births.  
Infant deaths, under 1 year, 13,754 (excluding still-births).  
Infant mortality rate, 56 per 1,000 live births.  
Infant deaths, under 1 month, 7,247 (excluding still-births).  
Neonatal mortality rate, 30 per 1,000 live births.

The neonatal mortality rate accounts for more than one-half of the infant mortality rate in Canada. Great progress has been made in the reduction of the total infant mortality rate, but only slow progress in the neonatal rate. There is the irreducible fetal and neonatal mortality rate, but the present rate is capable of further improvement. In a recent publication from this clinic<sup>2</sup> 229 consecutive deaths occurring before or during delivery, or within the first two weeks of life, were analyzed. In this series prematurity accounted for 49 deaths, and it is possible that adequate prenatal care of the mother and postnatal care of the baby might reduce this figure. The second commonest cause of these deaths was fetal deformity, which accounted for 37, and these are obviously beyond control. The accidents of labour and chronic illness of the mother accounted for the remainder, and these

present obstetrical problems which carry with them a considerable irreducible fetal mortality.

The rôle of nutrition in the growth and development of the infant has been recognized for a long time but the relation of adequate diet for the mother during pregnancy to fetal mortality rates has not been recognized. It is our purpose to try to point out the need for careful dietary supervision during pregnancy and to show how this could be carried out. A recent study of the influence of poor, improved, and good prenatal diet on the course of pregnancy is herein presented. The method of study has been reported elsewhere.<sup>3</sup>

The increased demands upon the maternal organism during pregnancy are well recognized. These demands are over and above normal non-pregnant requirements for good nutritional health. If the mother's diet is only barely adequate for her own needs, the increasing demands of the parasitic fetus will make the diet deficient for the mother. If the diet is already inadequate the deficiencies will become even greater if the needs of the fetus are satisfied.

TABLE I.  
DIETARY REQUIREMENTS DURING PREGNANCY

Calories.....	2,400-2,800	Vitamins:
Protein.....	80-100 grams	A — 6,000 i.u.
Fat.....	80-100 grams	B <sub>1</sub> — 500-1,000 i.u.
Carbohydrate	350-400 grams	B <sub>2</sub> — 3.0-3.5 mg.
Calcium....	1.5 grams	C — 50-75 mg.
Iron.....	0.020 grams	D — 500-1,000 units
Iodine.....	in iodized salt	

We recognize the amounts in Table I as the daily nutritional requirements during the second half of pregnancy. The figures are for normal pregnant women, doing light house-work. Transferred into practical terms this means that the average daily diet should have the following

\* Department of Paediatrics, University of Toronto, and Hospital for Sick Children, Toronto.

† Department of Obstetrics and Gynaecology, University of Toronto, and Toronto General Hospital.

‡ Dietary Department, Toronto General Hospital.

§ Visiting Homemakers' Association, Toronto.

essential foods: 40 ounces of milk daily, cheese, 1 oz.; one egg, butter and meat daily; liver once a week; two servings of vegetable besides potato daily; one orange or one-half grapefruit, or 5 ounces of tomato juice; at least one-half of cereals and bread in whole grain form; two teaspoonfuls of cod liver oil or equivalent in concentrate; salt to be iodized, and medicinal iron to be used if indicated.

Under certain abnormal conditions the above foods would have to be modified. In obesity the amount of fat and sugar should be reduced without interfering with the necessary amounts of the essential food factors.

In practice it is found that many women are receiving an inadequate diet. This is more frequent, of course, in the low income class. Lack of knowledge of the proper food to eat, together with long established habits, results in many poor diets. Fads and fancies about food during pregnancy also produce a few of the deficiencies encountered. In the treatment of special obstetrical cases, such as persistent vomiting, the dietary needs are often impossible to maintain. This requires expert management.

Education of the profession and the public in nutrition has become much more extensive in recent years. Unfortunately this does not reach everyone, particularly the poorer people who are perhaps in most need of this knowledge. Those with sufficient income are more likely to obtain the necessary foods for proper health. A more specific program of nutrition education in the schools with special reference to the diet and its importance during pregnancy should be given to all girls from 14 to 18 years of age. It seems to be impossible to reach more than a fraction of the female population with nutritional education after they have left school.

The value of prenatal care by private physicians and prenatal clinics is now recognized and used by a large proportion of the expectant mothers. The use of a part-time dietitian in all prenatal clinics would seem to be of value. She can give short practical instruction to groups of patients about the fundamentals of nutrition, and can co-operate with the physician in arranging the necessary help in planning a suitable diet for special cases.

In order to study the course of pregnancy in women on poor and on good prenatal diets we have studied the diet records and obstetrical course of some 400 women attending the prenatal clinic of the Toronto General Hospital.<sup>3</sup> We

have found that the most satisfactory method of determining the individual's diet is to have a record kept of everything consumed for each meal during a period of one week. In the study referred to, such a record was in each case analyzed by the dietitian attached to the clinic. We then placed the patient in one of three groups for observation.

1. In those with a poor diet record and a low income alternate patients were left on their poor diet. There were 120 of these observed as controls.

2. The other patients in this group with a poor diet and a low income were given certain foods which made a fairly good diet: 90 of these were followed and will be referred to as the Supplemented Group.

3. Those found to have sufficient income were given advice if their diet was deficient in any respect. They formed a group of 170 women who were improved by education, and will be called the "Good Diet Group".

Thus we have 120 women left in the Poor Diet Group, 90 women who were on poor diets until the 5th or 6th month of pregnancy and were then given extra food until 6 weeks after delivery, and 170 women with fairly adequate income who were instructed in the proper food to be eaten during pregnancy. The diet records were checked again at a later period.

To the Supplemented Group we had the dairy deliver daily 30 ounces of milk and one egg. The diet was further supplemented by 32 ounces of canned tomatoes, one-half pound of cheese, and 7 oranges per week. At the clinic we distributed viosterol capsules containing 2,000 units of vitamin D,<sup>4</sup> and embryo, a palatable wheat germ, with instructions to take one viosterol capsule and two tablespoonfuls of wheat germ daily. Instructions were also given for planning the remainder of the diet from the available income. The average cost of the food supplied to each patient was twenty-five dollars.

Table II is an analysis of the diets of the three groups of patients, comparing the first food record made about the sixth month of pregnancy with the second record made during the eighth month. Further details of the dietary findings have been published elsewhere.<sup>3</sup>

From Table II it will be noted that we have succeeded in improving the diet of the Supplemented Group by sending food to the patient

\* Kindly supplied by Mead Johnson & Co.

TABLE II.  
DIET ANALYSIS

<i>Average daily calories</i>		
<i>Poor diet</i>	<i>Supplemented</i>	<i>Good diet</i>
1st record.....	1,672	1,690
2nd record.....	1,837	2,424
<i>Average daily protein</i>		
<i>Poor diet</i>	<i>Supplemented</i>	<i>Good diet</i>
1st record.....	56	56
2nd record.....	62	94
<i>Average daily calcium</i>		
<i>Poor diet</i>	<i>Supplemented</i>	<i>Good diet</i>
1st record.....	0.537	0.562
2nd record.....	0.746	1.61
		0.886
		1.30

and by giving advice, while the Good Diet Group was improved by education alone.

Table III shows that the average total income of the persons not on relief was \$3.34 in the Poor Diet Group, only \$2.64 in the Supplemented Group, and was \$6.02 in the Good Diet Group.

TABLE III.  
ANALYSIS OF ECONOMIC STATUS OF PATIENTS STUDIED

	<i>Poor diet</i>	<i>Supplemented</i>	<i>Good diet</i>
Families on Welfare			
Relief.....	44 per cent	48 per cent	3 per cent
Average weekly income families not on relief.....	\$12.02	\$10.94	\$16.94
Average income per person.....	3.34	2.64	6.02

From Table IV it will be noted that the average age and duration of observation are comparable in the three diet groups. There were more primiparae in the Good Diet Group than in the other two groups.

TABLE IV.  
PATIENTS IN PRENATAL DIET STUDY

	<i>Poor diet</i>	<i>Supplemented</i>	<i>Good diet</i>
Average age.....	26 yrs.	27 yrs.	25 yrs.
Average duration of prenatal observation.....	4.4 mos.	4.7 mos.	4.4 mos.
Primipara.....	31 per cent	29 per cent	46 per cent

The percentages of complications in previous pregnancies in the three groups are compared in Table V. The number of miscarriages, prematures, and stillbirths was greater in the Supplemented Group. Therefore, one would expect an equal proportion of complications to develop

in the pregnancy being studied. The only conditions which differed in the care and management of these patients was the food supplied to the Supplemented Group and the education given to the Good Group. The obstetrician and nurses in charge of the patients were not aware of the diet group to which the patients belonged. No patient was included in the study if found to have any condition which might complicate the study and all were observed and confined at the Toronto General Hospital. The study began in November, 1938, and was concluded in March, 1941.

TABLE V.  
PAST OBSTETRICAL HISTORY OF PATIENTS STUDIED

	<i>Poor diet</i>	<i>Supplemented</i>	<i>Good diet</i>
	<i>percentage</i>	<i>percentage</i>	<i>percentage</i>
Miscarriages..	38.1	39.0	24.4
Prematures...	10.7	20.3	13.3
Stillbirths....	9.5	4.7	2.2

The senior resident obstetrician in charge of the patients in the Prenatal Clinic and in the hospital has given his rating of the condition and progress of the patient in each period of pregnancy. He was unaware of the diet group to which each patient belonged. A "good" rating indicated that the patient had progressed satisfactorily. "Fair" rating indicated that minor complications had developed at some stage of the period of observation. "Poor" meant that many or major complications had developed, while "bad" was reserved for serious complications endangering the life of the mother or resulting in the death of the baby.

TABLE VI.  
PRENATAL RATING BY OBSTETRICIAN

	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<i>Bad</i>
	<i>percentage</i>	<i>percentage</i>	<i>percentage</i>	<i>percentage</i>
Poor Diet..	30.2	33.6	32.8	3.4
Supple- mented...	49.4	41.4	9.2	0
Good Diet ..	52.2	35.5	11.9	0.3

Thirty-six per cent of those in the Poor Diet Group were given a poor or bad rating, as compared with only 9 per cent in the Supplemented Group (Table VI). The complications which affected the obstetrician's rating are shown in the next table (Table VII). It will be noted that there were more cases of anaemia, eclampsia, and threatened miscarriage in the Poor Diet Group, while the total number of complications in this group was almost double that in the Supplemented Group.

TABLE VII.  
COMPLICATIONS DURING PRENATAL PERIOD

	Poor diet percentage	Supple- mented percentage	Good diet percentage
Numerous minor complaints.....	33.6	20.7	19.7
Anæmia (below 65 per cent Hgb.).....	28.6	16.1	21.6
Pre-eclampsia and eclampsia.....	12.6	9.1	7.8
Threatened miscarriage (any prenatal vaginal bleeding).....	11.2	8.3	4.7
Accidental haemorrhage.....	3.2	4.7	0
Placenta praevia.....	0.8	0	1.1
Severe vomiting.....	3.4	1.1	1.2
Pyelitis.....	5.0	3.4	4.2
Streptococcal vaginitis.....	1.7	0	0
No complications recorded.....	30.3	45.9	48.5

In a similar manner the obstetrician also gave a rating during labour (Table VIII). A "poor" or "bad" rating was given to 24 per cent of those in the Poor Diet Group during the actual labour period, as compared with only 3 per cent of those in the Supplemented Group.

TABLE VIII.  
RATING BY OBSTETRICIAN OF CONDITION DURING LABOUR

	Good percentage	Fair percentage	Poor percentage	Bad percentage
Poor Diet..	58.6	17.2	14.7	9.5
Supple- mented...	85.1	12.6	2.3	0
Good Diet..	69.8	24.3	4.0	1.9

Variation in the incidence of miscarriages, premature births, and stillbirths is strikingly shown in Table IX. The other complications, while not as striking, are nevertheless significant, being more frequent in the Poor Diet Group.

TABLE IX.  
MAJOR COMPLICATIONS DURING LABOUR

	Poor diet percentage	Supplemented percentage	Good diet percentage
Miscarriages.....	6.0	0	1.2
Premature births...	8.0	2.2	3.0
Stillbirths.....	3.4	0	0.6
Hæmorrhage-post- partum.....	6.5	5.9	5.8
Long labour.....	7.0	3.4	9.0
Primary uterine inertia.....	6.0	0	3.5
Secondary uterine inertia.....	3.5	1.1	4.2
Required blood transfusion or intra-venous.....	2.6	0	0.6
No complications recorded.....	58.6	84.0	68.0

The average duration of labour was found to be greater in the Poor Diet Group, both in primiparous and multiparous patients (Table X).

TABLE X.  
AVERAGE DURATION OF LABOUR

	Poor diet Hours	Supplemented Hours	Good diet Hours
Primipara.....	21.7	16.6	20.2
Multipara.....	11.9	10.2	10.8

A rating of postpartum convalescence was also made by the resident obstetrician. Table XI gives these findings.

TABLE XI.  
CONDITION OF MOTHER DURING CONVALESCENCE IN HOSPITAL

	Good percentage	Fair percentage	Poor percentage	Bad percentage
Poor Diet..	59.9	28.6	9.8	1.7
Supple- mented...	79.5	17.0	2.3	1.2
Good Diet..	70.2	20.8	9.05	0

The number of complications, particularly anæmia, uterine and breast inflammation, was greater in the Poor Diet Group (Table XII).

TABLE XII.  
COMPLICATIONS IN MOTHER DURING HOSPITAL CONVALESCENCE

	Poor diet percentage	Supple- mented percentage	Good diet percentage
Anæmia (below 65 per cent Hgb.).....	24.1	12.5	19.2
Pelvic inflammation.....	9.0	3.4	6.1
Breast inflammation....	4.5	2.3	4.8
Cystitis or pyelitis.....	0.9	1.1	3.0
Phlebitis.....	1.8	0	0.6
Impetigo.....	0.9	0	0
Embolism or thrombosis	0	1.1	0.6
Intestinal obstruction..	0	0	0.6
Streptococcal vaginitis.....	0.9	0	0
No complications recorded.....	52.6	70.4	59.0

The marked increase of food, and particularly calories, did not apparently have any influence upon the size of the infant at birth. The average birth weight in the poorly fed mothers was slightly greater than in the two better fed groups (Table XIII).

TABLE XIII.  
AVERAGE BIRTH-WEIGHT OF BABIES

Poor Diet.....	7 lb. 10 oz.
Supplemented.....	7 lb. 7 oz.
Good Diet.....	7 lb. 6½ oz.

At the follow-up visit, six weeks after the birth of the baby, the obstetrician rated 11 per cent of those in the Poor Diet Group as in poor or bad condition, and only 3 per cent of those in the Supplemented Group (Table XIV). The complications six weeks after delivery were chiefly anaemia, vaginal discharge, cervicitis, and breast inflammation. The total number of complications was four times as great in the Poor Diet Group as in the Supplemented Group (Table XV).

TABLE XIV.  
OBSTETRICIAN'S RATING OF THE MOTHER  
SIX WEEKS POST PARTUM

	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<i>Bad</i>
Poor Diet..	55.7	33.0	11.3	0
Supple- mented...	87.0	10.6	1.2	1.2
Good Diet..	84.8	12.4	2.1	0.7

TABLE XV.  
COMPLICATIONS IN MOTHERS  
SIX WEEKS AFTER DELIVERY

	<i>Poor diet</i>	<i>Supplemented</i>	<i>Good diet</i>
	<i>percentage</i>	<i>percentage</i>	<i>percentage</i>
Anæmia.....	9.0	0	1.4
Minor complaints...	21.0	7.0	4.2
Cystitis or pyelitis...	2.0	0	0
Vaginal discharge and cervicitis...	8.0	1.1	0.7
Breast abscess....	3.0	1.1	2.0
No complications recorded.....	50.0	88.0	84.0

The record of successful breast feeding was very much better in those mothers who were receiving a good diet, particularly the Supplemented Group (Table XVI).

TABLE XVI.  
INCIDENCE OF BREAST FEEDING 6 WEEKS POST PARTUM

	<i>Nursing</i>	<i>Artificially fed</i>
	<i>percentage</i>	<i>percentage</i>
Poor Diet.....	59	41
Supplemented.....	86	14
Good Diet.....	71	29

The condition of the mother's teeth was rated as "Good", "fair" or "poor" by a clinical examination of the mouth six months after the birth of the baby (Table XVII). Complete dental examinations and x-rays were made by Dr. C. B. Shillington during the prenatal period, but the records have not been completed.

The obstetrician also made a rating of the whole course of pregnancy from the time that the mother first came under observation in the

TABLE XVII.  
CONDITION OF MOTHER'S TEETH—  
6 MONTHS POST PARTUM

	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<i>False</i>
	<i>percentage</i>	<i>percentage</i>	<i>percentage</i>	<i>percentage</i>
Poor Diet..	27	19	48	6
Supple- mented...	44	20	24	12
Good Diet..	60	19	15	6

prenatal clinic until her follow-up visit six weeks after the birth of her baby. Thirty-four per cent of the pregnancies in the Poor Diet Group were considered poor or bad, as compared with only 6 per cent in the Supplemented Diet Group (Table XVIII). In other words, the mothers

TABLE XVIII.  
FINAL OBSTETRICAL RATING

	<i>Excellent</i>	<i>Good-Fair</i>	<i>Poor</i>	<i>Bad</i>
	<i>percentage</i>	<i>percentage</i>	<i>percentage</i>	<i>percentage</i>
Poor Diet..	13.1	52.9	22.6	11.3
Supple- mented...	34.5	59.6	5.9	0
Good Diet..	30.6	54.1	14.2	1.1

in the Supplemented Group were considered far better obstetrical risks throughout the whole course of pregnancy. The obstetrician's rating and the lists of complications do not indicate the frequency with which we noted improvement in the general mental attitude of the patients in the Supplemented Diet Group, nor does it indicate the number who lost their minor aches and pains and numerous complaints. These were factors which could not be accurately measured.

#### SUMMARY

1. The needs of the expectant mother with respect to her diet are recorded.
2. A study of the diets of 400 expectant women is reported.
3. Milk, eggs, tomatoes, oranges and cheese were supplied to 90 of the women in the study, from the 4th or 5th month of pregnancy until four weeks after discharge from the hospital.
4. There was a much higher incidence of miscarriage, stillbirths, premature births and minor complications in those women found to have Poor Diets throughout pregnancy.
5. The whole course of pregnancy appeared to be influenced by supplying simple foods to those on deficient diets, and by giving advice to those who could afford a proper diet.

## REFERENCES

1. Preliminary Annual Report Vital Statistics of Canada, 1940.
2. SCOTT, W. A.: *Am. J. Obst. & Gyn.*, 1940, 39: 382.
3. EBBS, J. H., TISDALL, F. F. AND SCOTT, W. A.: The influence of prenatal diet on the mother and child. *J. Nutrition*, 1941, 22: 515.

## RÉSUMÉ

Le taux de la mortalité maternelle est passé de 5.7 pour 1,000 qu'il était en 1926 à 4.0 pour 1,000 en 1940. On peut faire davantage si l'alimentation de la mère est mieux surveillée. On commence déjà à y parvenir en appliquant aux femmes enceintes les principes de l'hygiène alimentaire traditionnelle et en ajoutant au régime des mères nécessiteuses les éléments nutritifs ou vitamino-minéraux déficitaires. Le public et la profession médicale ont été mieux avertis du problème alimentaire des mères, notamment des mères nécessiteuses. Cette propagande doit continuer dans les écoles et dans les cliniques prénatales. Nous avons classé nos malades selon leurs revenus et nous avons augmenté la ration alimentaire des pauvres; nous avons corrigé les régimes des malades plus aisées. Le groupe des pauvres reçut tous les jours 30 onces de lait, un œuf, des tomates en boîte, du fromage, une orange et du viosterol. Le nombre des fausses couches, des prématurés et des mort-nés fut plus élevé dans le groupe des mères "supplémentées"; celles-ci furent aussi plus fréquemment atteintes d'anémie et la durée de leur travail fut plus longue. Les mêmes remarques sont applicables aux complications du post-partum et à l'état des dents. En somme, tous les besoins alimentaires de la mère sont notés avec les ennuis que produit l'écart de la règle. JEAN SAUCIER

## THE INFLUENCE OF IMPROVED PRENATAL NUTRITION UPON THE INFANT

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F. F. TISDALL, M.D., F.R.C.P.(C),\* WINIFRED J. MOYLE, B.Sc.† AND MARJORIE BELL, B.Sc.‡

*Toronto*

THE annual statement of the Medical Officer of Health for the City of Toronto for 1939<sup>1</sup> has the following to say about infant mortality. "A reduction of almost 40 per cent has taken place since 1929 . . . Neonatal causes continue to be our main problem in that the average rate for the past five years for deaths occurring under one month of age shows an improvement of only 7 per cent, as against a drop of 37 per cent in mortality among infants from a month to one year of age." The same is true in the statistics for Canada as shown in the preceding paper. Canada's infant mortality ranked 16th in a list of 40 countries in 1937.<sup>2</sup>

While there are many probable factors responsible for the persistently higher rate in the neonatal period, we are attempting to show how one factor, namely, the mother's prenatal diet, can play an important part in improving the successful outcome of pregnancy.

In a previous publication<sup>3</sup> the method of study and nutritional observations have been recorded. In the first section of this paper, the obstetrical results have been summarized.<sup>4</sup> Three groups of patients attending the prenatal clinic before the sixth month of pregnancy were observed. (a) A group of 120 women on poor diets and low incomes, referred to as the Poor Diet group. Their diet was not altered by the clinic. (b)

A second group of 90 women on diets as poor as those of the first group was sent supplemental foods; this formed the Supplemented Diet group. (c) In a third group of 170 women it was found that the diets were moderately good and the income was sufficient to furnish a good diet. In this group the women were given advice only and are referred to as the Good Diet group.

To the Supplemented group, we were able to send, through a special fund administered through the Visiting Homemakers' Association, the following foods: 30 ounces of milk, one egg and one orange daily; weekly we sent the daily equivalent of 3½ oz. of canned tomatoes and one ounce of cheese. At the clinic we distributed viosterol capsules containing 2,000 units of vitamin D,\* and embryon, a palatable wheat germ, with instructions to take one viosterol capsule and two tablespoonfuls of wheat germ daily. Thus we formed three groups: one left on poor diet to serve as controls; another on poor diets but given extra food for 4 or 5 months of the prenatal period and for 4 weeks after leaving the hospital; and a third who were given advice only.

Observations of each patient were made by the obstetrician and each patient was given a rating based upon general condition, progress, complications and final outcome of pregnancy. These ratings are summarized in Table I.

Thirty-four per cent of the women in the Poor Diet group were rated as poor or bad,

\* From the Department of Paediatrics, University of Toronto, and Hospital for Sick Children, Toronto.

† Dietary Department, Toronto General Hospital.

‡ Visiting Homemakers' Association, Toronto.

\* Kindly supplied by Mead Johnson & Co.

TABLE I.  
RATING BY OBSTETRICIAN OF COURSE OF PREGNANCY

	Excellent or Good percentage	Poor or bad percentage
Poor Diet .....	66	34
Supplemented Diet .....	94	6
Good Diet .....	85	15

compared with only 6 per cent of those in the Supplemented group. This rating, which was much better in the women in the Supplemented and Good Diet groups, was influenced by the number of complications which occurred during pregnancy.

It will be noted from Table II that those

TABLE II.  
PRINCIPAL COMPLICATIONS DURING PREGNANCY

	Poor diet percentage	Supple- mented percentage	Good diet percentage
<i>Prenatal period</i>			
Anæmia .....	28.6	16.1	21.6
Pre-eclampsia and eclampsia .....	12.6	9.1	7.8
Threatened miscarriage .....	11.2	8.3	4.7
<i>Labour</i>			
Miscarriages .....	6.0	0	1.2
Premature births .....	8.0	2.2	3.0
Stillbirths .....	3.4	0	0.6
Primary uterine inertia .....	6.0	0	3.5
<i>Convalescence</i>			
Pelvic inflammation ...	9.0	3.4	6.1
Breast inflammation ...	4.5	2.3	4.8

mothers who were in the Poor Diet group suffered many more complications during pregnancy. The expected rate of complications in the Supplemented group was the same as in the Poor Diet group. The only factor in the care and management of the patients in the two groups was the addition of food to the Supplemented group.

While the more successful course of pregnancy in the Supplemented group has influenced the health of the mother, we have also been interested in its effect upon the infant during its first year of life. It is well known that anæmia in the mother during the latter half of the prenatal period predisposes the infant to anæmia during its first year of life. The higher incidence of anæmia in the Poor Diet group was in spite of iron therapy prescribed by the clinic. Miscarriages and stillbirths can be considered with infant mortality in any attempt to find means of reducing this loss of life. Prematurity was the chief cause of infant mortality in Canada in 1939. It was responsible for nearly 25 per cent of all deaths under one year of age. In 1940 there were 1,307 deaths per 100,000 live births in Canada resulting from

prematurity.<sup>2</sup> The number of miscarriages, stillbirths and premature births in the women in the study described, who were receiving a reasonably adequate diet, was very much lower than in those who remained on their poor diets. Nutrition seems to have played an important rôle in the outcome of these pregnancies.

The condition of the baby at birth and its progress during its stay in hospital has been rated as "good", "fair", "poor" or "bad" (Table III). Babies with gross congenital ab-

TABLE III.  
RATING OF BABY IN FIRST TWO WEEKS

	Good percentage	Fair percentage	Poor percentage	Bad percentage
Poor Diet .....	62.3	23.7	5.3	8.7
Supplemented Diet .....	90.5	9.5	0	0
Good Diet ...	72.2	23.8	1.2	3.0

normalities have not been included in the rating.

It will be noted that 14 per cent of the babies in the Poor Diet group were given a "poor" or "bad" rating. This includes miscarriages and stillbirths. "Poor" or "fair" indicates slow or difficult progress or poor general condition after birth.

An attempt has been made to follow up the babies born in this study. Whenever possible examination has been made at intervals of six months.

While the average birth weight of the babies in the Poor Diet group was slightly greater than the other two groups, the weight at six months is greater in the Supplemented group (Table IV). The mothers in this group received the

TABLE IV.  
AVERAGE WEIGHT OF INFANTS

	Birth weight	6 months
Poor Diet .....	7 lb. 10 oz.	15 lb. 14 oz.
Supplemented Diet .....	7 lb. 7 oz.	16 lb. 7 1/2 oz.
Good Diet .....	7 lb. 6 1/2 oz.	16 lb. 6 oz.

extra food for only 4 weeks after discharge from the hospital. Sixty-two per cent of the babies in the Supplemented group had regained their birth weight or more when discharged from the hospital, compared with only 45 per cent in the Poor Diet group.

The supervisor of nurses in the obstetrical division of the hospital observed the ability of the mothers to nurse their infants. "Good" rating indicates successful breast feeding (Table V). "Fair" rating is used when supplemental feeding is necessary and the progress of the baby is not as rapid as normal. "Poor" in-

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It will be noted from Table II that those

TABLE II.

	Poor diet percentage	Supple- mented percentage	Good diet percentage
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Threatened miscarriage .....	11.2	9.3	4.7
<i>Labour</i>			
Miscarriages .....	6.0	0	1.2
Premature birth .....	5.0	2.2	3.0
Stillbirths .....	3.4	0	0.6
Primary uterine inertia .....	6.0	0	3.5
<i>Contalgence</i>			
Pelvic inflammation ...	9.0	3.4	6.1
Breast inflammation ...	1.5	2.3	4.8

mothers who were in the Poor Diet group suffered many more complications during pregnancy. The expected rate of complications in the Supplemented group was the same as in the Poor Diet group. The only factor in the care and management of the patients in the two groups was the addition of food to the Supplemented group.

While the more successful course of pregnancy in the Supplemented group has influenced the health of the mother, we have also been interested in its effect upon the infant during its first year of life. It is well known that anæmia in the mother during the latter half of the prenatal period predisposes the infant to anæmia during its first year of life. The higher incidence of anæmia in the Poor Diet group was in spite of iron therapy prescribed by the clinic. Miscarriages and stillbirths can be considered with infant mortality in any attempt to find means of reducing this loss of life. Prematurity was the chief cause of infant mortality in Canada in 1939. It was responsible for nearly 25 per cent of all deaths under one year of age. In 1940 there were 1,307 deaths per 100,000 live births in Canada resulting from

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The condition of the baby at birth and its progress during its stay in hospital has been rated as "good", "fair", "poor" or "bad" (Table III). Babies with gross congenital ab-

TABLE III.  
RATING OF BABY IN FIRST TWO WEEKS

	Good percentage	Fair percentage	Poor percentage	Bad percentage
Poor Diet ...	62.3	23.7	5.3	8.7
Supplemented				
Diet ....	90.5	9.5	0	0
Good Diet ...	72.2	23.8	1.2	3.0

normalities have not been included in the rating.

It will be noted that 14 per cent of the babies in the Poor Diet group were given a "poor" or "bad" rating. This includes miscarriages and stillbirths. "Poor" or "fair" indicates slow or difficult progress or poor general condition after birth.

An attempt has been made to follow up the babies born in this study. Whenever possible examination has been made at intervals of six months.

While the average birth weight of the babies in the Poor Diet group was slightly greater than the other two groups, the weight at six months is greater in the Supplemented group (Table IV). The mothers in this group received the

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AVERAGE WEIGHT OF INFANTS

	Birth weight	6 months
Poor Diet .....	7 lb. 10 oz.	15 lb. 14 oz.
Supplemented Diet ...	7 lb. 7 oz.	16 lb. 7 $\frac{1}{2}$ oz.
Good Diet .....	7 lb. 6 $\frac{1}{2}$ oz.	16 lb. 6 oz.

extra food for only 4 weeks after discharge from the hospital. Sixty-two per cent of the babies in the Supplemented group had regained their birth weight or more when discharged from the hospital, compared with only 45 per cent in the Poor Diet group.

The supervisor of nurses in the obstetrical division of the hospital observed the ability of the mothers to nurse their infants. "Good" rating indicates successful breast feeding (Table V). "Fair" rating is used when supplemental feeding is necessary and the progress of the baby is not as rapid as normal. "Poor" in-

TABLE V.

ABILITY OF MOTHER TO NURSE INFANT IN THE HOSPITAL

	Good	Fair	Poor
	percentage	percentage	percentage
Poor Diet .....	42.0	41.0	17.0
Supplemented Diet .....	52.0	42.0	6.0
Good Diet .....	49.0	43.0	8.0

dicates very slow progress, marked loss of weight on breast milk, poor supply of breast milk, or artificial feeding.

Only 6 per cent of the mothers in the Supplemented group compared with 17 per cent in the Poor group were rated as "poor" in breast feeding.

From these records (Table VI) it appears that

TABLE VI.

ILLNESSES RECORDED FROM BIRTH TO 6 MONTHS

	Poor diet	Supplemented	Good diet
	percentage	percentage	percentage
Pneumonia .....	5.5	1.5	0.9
Bronchitis .....	4.2	1.5	5.7
Frequent colds .....	21.0	4.7	4.7
Otitis media .....	1.4	1.5	4.7
Anæmia .....	25.0	9.4	17.1
Dystrophy .....	7.0	1.5	0
Rickets .....	5.5	0	0.9
Tetany of newborn ..	4.2	0	0

infants born of mothers on a poor prenatal diet were more susceptible to infections and nutritional diseases, such as rickets, than are infants born of mothers on a good prenatal diet. The general condition and appearance of the babies in the Supplemented Diet group was much better than in the Poor Diet group.

Two babies in the Poor Diet group have died from pneumonia and one from prematurity (Table VII). When we add to these the num-

TABLE VII.  
MISCARRIAGES AND INFANT DEATHS

	Poor diet	Supple- mented	Good diet
Total patients observed .....	120	90	170
Miscarriages .....	7	0	2
Stillbirths .....	4	0	1
Deaths recorded in first 250 babies followed up to 6 months .....	3	0	0
	—	—	—
Congenital malformation ..	1	2	1

ber of miscarriages and stillbirths, the final record of the Poor Diet group babies is much worse than the other two groups.

## SUMMARY

The addition of certain simple foods to the diets of a low income group of women has re-

sulted in a very much better record throughout their pregnancy, when compared with another group of women who were left on equally low diets. The incidence of complications during the prenatal period, during labour and during convalescence was much less in the women who received the supplemental food.

The relation of this lowering of maternal complications to the successful outcome of pregnancy and particularly its effect upon the fetus and later the newborn infant, could only be favourable. The smaller percentage of miscarriages, stillbirths and premature births would alone justify the cost of nutritional help to these needy mothers. The lowered infant mortality during the first six months of life and the much lower incidence of illness are also striking. The difference in the appearance of the infants in the good diet groups was strikingly better than those born of mothers on a poor prenatal diet.

The use of our present knowledge of nutrition in the prophylactic care of the expectant mother should be strongly urged. It is the first step and a most important one, in assuring sound structural development during the period of rapid fetal growth, and in producing a healthy infant during its first months of life. The application of the principles of nutrition could not be more important in any other period of life than during pregnancy.

## CONCLUSION

The percentage of successful pregnancies amongst poor women was increased by supplying simple foods. The effect upon infant mortality and morbidity was striking.

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## RÉSUMÉ

A Toronto, la mortalité infantile a été réduite de 40 pour cent au cours des 12 dernières années, depuis que les mères indigentes absorbent des nourritures mieux équilibrées durant la période pré-natale. Les rations alimentaires des plus pauvres ont été enrichies de lait, d'œufs, d'oranges, de tomates, de fromage et de vitésterol. Les bons effets se sont fait sentir parallèlement chez les nouveau-nés. Le nombre des grossesses avant terme fut considérablement réduit et l'état général des nouveau-nés jusqu'à l'âge de 6 mois s'est singulièrement relevé. Voilà une application frappante des principes hygiénico-diététiques et des résultats indiscutables.

JEAN SAUCIER

## THE SURGICAL KIDNEY AS AN ETIOLOGICAL FACTOR IN HYPERTENSION\*

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IT has long been known that hypertension was related in some way to pathological changes in the kidney. Some observers have claimed that renal disease is present in every case of hypertension. Others have held the opinion that so-called essential hypertension in most cases is caused by undetermined factors other than renal. When clinical evidence of renal disease is present it may be either an etiological factor of hypertension or only a coincidental finding. Many experiments have shown the possible relationship between renal disease and hypertension. The simple experiments performed by Goldblatt, Lynch, Hanzal and Shumerville,<sup>1</sup> in the Laboratory of Pathology at Western Reserve University demonstrated more clearly the direct relationship of renal disease to hypertension than any other previous experiments. These experiments showed that impairment of renal circulation, even when unilateral, could be an etiological factor in cases of hypertension. No physiological investigation has ever received more definite clinical corroboration. Many case reports have been published which should remove any doubt that hypertension may result from certain types of unilateral renal changes. These reports also have shown that elevated blood pressure may return to normal and remain so following removal of a so-called surgical kidney.

The experiments of Goldblatt and his associates and subsequent clinical investigations have not only led to important therapeutic results but, what is of equal importance, they have initiated far-reaching discoveries which eventually may lead to the cause and cure of hypertension. The investigations of Page, Helmer, Kohlstaedt, Fouts and Kempf<sup>2</sup> in this field have been outstanding. They have demonstrated that a vasoconstrictor substance, which they have called angiotonin, is liberated in increased amounts in the renal tissues of hypertensive animals. They expressed the opinion that angiotonin is formed by the enzymatic reaction of renin with a renin

activator. Angiotonin causes an increase in arterial pressure and a decrease in renal blood flow as the result of arteriolar vasoconstriction. In a recent contribution, Corcoran and Page<sup>3</sup> made the following statement: "The release of renin which initiates the process appears not to depend on renal ischaemia but rather on a change from pulsatile to continuous blood flow within the kidney; that is, an intrarenal reduction in blood pressure." Page, Helmer, Kohlstaedt, Fouts and Kempf also have shown that an extractable antihypertensive substance is present in normal kidneys. They have recently prepared an antihypertensive substance from normal kidneys, which has lowered the blood pressure of patients suffering from severe, fixed hypertension.

Wakerlin, Gomberg and Johnson<sup>4</sup> recently demonstrated that hog rennin can be used successfully in reducing high blood pressure in dogs. Not only have they been able to cause a reduction of blood pressure in hypertensive animals, by injection of rennin but they also have been able to prevent hypertension in dogs by vaccinating the animals with rennin. They claimed that hog rennin reduces blood pressure in dogs by stimulating the production of antirenin. They expressed the opinion that the effect of hog rennin in lowering blood pressure is not due to the presence of a substance in the kidney but is due to various tissues of the body. Although much progress already has been made, it is evident that the last word has not been said in this fascinating search for the etiological factors involved in hypertension.

With this brief review of recent investigations in this field, I now shall consider the only definite etiological factor of hypertension as yet demonstrated clinically, namely, the "surgical" kidney. How often are patients observed with a unilateral surgical kidney which carries hypertension? Several clinical reports have been made which grossly exaggerate the incidence of surgical kidney as the causal factor in hypertension. A review of cases of hypertension observed at the Mayo Clinic showed that the percentage of patients having clinical or roentgenographic

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evidence of unilateral "surgical", or non-nephritic, renal disease is very small. In the course of routine examination of patients at the clinic, hypertension was discovered in approximately 4,000 cases in one year. Clinical evidence of a "surgical" renal lesion was found in approximately 100 of these cases of hypertension (2.5 per cent). This group of patients was subjected to careful roentgenographical, urological and clinical examinations and only 19 (less than 0.5 per cent) were selected for operation. In the other 81 cases the renal lesion was regarded either as coincident and not related to the hypertension or there were factors which contraindicated operation. These statistics would indicate that only a fraction of 1 per cent of hypertensive patients are amenable to surgical treatment of the kidneys.

The question might be asked, how is one to recognize the presence of surgical renal lesions which may cause hypertension. Is one justified in making a careful roentgenographical and urographical examination, and possibly a cystoscopic examination, in every case in which hypertension is present? At the Clinic, we have found that it is unnecessary to do so. It has been our experience that a surgical renal lesion is seldom, if ever, present unless at least one of the following criteria are present: (1) a history of present or previous symptoms indicating involvement of the urinary tract; (2) the presence of leukocytes or erythrocytes in the urine; (3) evidence of renal changes in the roentgenogram, or (4) positive findings on physical examination suggestive of renal involvement. Excretory urography or cystoscopic examination seldom are indicated unless some of the data are present.

It would be simple enough to subject every patient with hypertension to simple roentgenological examination of the urinary tract. The data derived from visualization of the renal outline in the ordinary roentgenogram offer a valuable, although not exact, method of detecting surgical lesions of the kidney. A marked difference in the size and shape of the two kidneys should call attention at once to the possibility of a renal lesion. In fact, the diagnosis of atrophic pyelonephritis can be inferred in most cases from an examination of the renal outline. The outline of a small atrophied kidney with median displacement can be seen on one side and an hypertrophied kidney on the other side.

In the routine urographical study of cases of hypertension evidence of deformity in the

urinary tract often is observed. Most of these lesions, such as renal ptosis, angulation of the ureter, slight pyelectasis, slight abnormality of the outlines of the calices, pelvis or ureter, resulting from previous infection or from pregnancy, usually are of little or no significance as far as the hypertension is concerned. The clinical importance of many of these deformities has been misinterpreted and exaggerated in several articles dealing with this problem. It is only by careful cystoscopical and urological examination in experienced hands that clinical evaluation of many of the apparent urographical lesions is possible.

Having found some evidence suggestive of involvement of the kidney, the next step is to determine whether or not a renal operation is indicated. The small group of cases of hypertension in which there is clinical evidence of a "surgical" renal lesion will include many cases in which operation would be inadvisable for the following reasons: (1) In order to be amenable to surgical procedure the lesion must be unilateral. Evidence of bilateral renal disease would exclude a number of cases immediately from further consideration. (2) Many cases are observed in which there is a minor degree of unilateral renal disease which very evidently is incidental and not the cause of hypertension. It may be difficult to determine by clinical examination whether a renal lesion is a direct etiological factor or only incidental to the hypertension. In some of these cases a renal operation might be justifiable on a chance. (3) Patients are observed with hypertension associated with a surgical renal lesion which may have existed so long that vascular changes and involvement of other organs have occurred to such an extent that removal of the diseased kidney would be inadvisable. (4) Patients more than fifty years of age seldom are benefited unless the hypertension is of recent onset. For these reasons most of the patients with renal lesions first selected are eliminated and as a result it has been our experience that there remains only a fraction of 1 per cent of cases of hypertension in which renal operation would offer a chance for relief.

What are the "surgical", or non-nephritic, lesions which cause hypertension? In the order of their decreasing frequency of occurrence, the following types of such renal lesions were observed in our series of cases: (1) atrophic forms of pyelonephritis, including those developing

after previous renal operations; (2) renal neoplasm; (3) renal lithiasis; (4) hydronephrosis; (5) tuberculosis, and (6) polycystic kidneys. There are other surgical lesions involving the kidney that have been observed with hypertension but the lesions cited are seen most often. We have found only two cases in which pressure on or obliteration of the renal artery was the apparent cause of hypertension. Acute renal infection seldom causes hypertension. That chronic renal infection is a common factor is shown by the higher incidence of hypertension in cases of renal stone and hydronephrosis in which infection occurred. It should be remembered that although the infection may be dormant, ischaemic changes may be present in the renal tissues as the result of a previous infection.

When one has decided on renal operation, what permanent benefits can be expected? Most observers are agreed that the best results are obtained in young patients and when the hypertension is of comparatively recent origin. Chute<sup>6</sup> stated it very well when he said that only cases should be selected in which "the cement has not set" and vascular changes have not become permanently established. Permanent recovery was noted in only one of our patients who were more than fifty years of age. Retinal disease, when far advanced, usually contraindicates operation on adults, but may not do so in the case of children. Although the blood pressure may drop following operation, it frequently returns to its former level after a variable period, even as long as a year later. Even in a carefully selected group of patients with surgical renal lesions a permanent drop in blood pressure following operation is observed in about a third of the cases. In other words, the hypertensive patient who has been selected for renal operation should be told at the outset that he has about one chance in three for recovery. The best results have been obtained in cases in which there are cicatricial renal infection and atrophy, such as occur with atrophic forms of pyelonephritis, or following previous conservative renal operation. Approximately 60 per cent of such patients will recover. Approximately 50 per cent of patients with hypertension and renal tuberculosis will recover after nephrectomy. The blood pressure will return to normal in 25 per cent of cases of hypertension associated with renal stone or hydronephrosis.

Surgical removal of a diseased kidney which seemed to be the etiological factor of hypertension caused no change in the blood pressure in many cases. Recently, a patient with a systolic blood pressure of 220 mm. of mercury was operated on at the clinic for a cystic renal tumour. Exploration revealed several large simple renal cysts which had caused renal atrophy. A large branch of the renal artery was found to be almost obliterated. This combination of renal lesions should be a classical setup for hypertension. Contrary to expectation, there was no change in the patient's blood pressure three weeks after nephrectomy. It is impossible to determine from pre-operative clinical data whether the blood pressure will return to normal following operation. Hines and Lander<sup>6</sup> have shown that the chances for post-operative relief are definitely lessened if there is a familial tendency to hypertension.

The question may well be raised, is there any particular type of renal lesion which favours the secretion of a pressor substance? It apparently is established that intrarenal vascular change is the essential factor which causes hypertension. Although regions of tissue atrophy and vascular sclerosis of variable extent usually are present, there does not seem to be any specific lesion in the renal tissues which always is associated with hypertension. Gross and microscopic examination of kidneys removed from patients with hypertension may show pathological changes which are exactly similar to those found in cases in which there was no elevation in blood pressure. The degree of hypertension is not dependent on the extent of renal destruction, but, as recent investigation has shown, on the resulting changes in intrarenal blood flow. It is evident that the problems involved are physiological in origin.

#### CHRONIC UNILATERAL PYELONEPHRITIS

Chronic infection associated with cicatricial regions in the renal parenchyma is the non-nephritic renal lesion most frequently observed with hypertension. Acute renal or perirenal infection seldom is a causal factor. The chronic renal infection may be either primary or secondary to some other intrarenal lesion, such as lithiasis or hydronephrosis. Although primary chronic unilateral pyelonephritis is not a common lesion, yet when present it frequently causes hypertension. It usually is observed in one of three forms, namely: (1) unilateral diffuse pyelonephritis with only moderate reduction in size of the kidney and with limited cicatricial altera-

tions; (2) unilateral atrophic pyelonephritis, with advanced atrophy and diffuse cicatricial changes, and (3) post-operative pyelonephritis developing in a kidney previously operated on.

#### ATROPHIC PYELONEPHRITIS

Because the relative incidence of hypertension among patients with atrophic pyelonephritis is high (47 per cent), this lesion often is cited as the renal lesion which usually causes hypertension. It also is often referred to because of the large proportion of cases in which a permanent reduction in blood pressure follows nephrectomy (70 per cent). However, atrophic pyelonephritis as a clinical entity is not observed very often, as shown by the fact that only 43 patients who had the disease were operated on at the clinic in a period of ten years. This lesion is the result of extensive renal infection and is characterized by widespread atrophy of the renal tissues and sclerosis of the renal blood vessels. The resulting intrarenal vascular imbalance apparently is a factor in causing hypertension. Atrophic pyelonephritis should be distinguished from renal hypoplasia. The latter condition is characterized by a similar reduction in size of the kidney but is not accompanied by cicatricial and inflammatory changes. The urographical data usually will permit differentiation. The irregular pyelectasis and caliectasis observed with atrophic pyelonephritis usually are in marked contrast to the smooth, infantile outline of pelvis and calices observed with hypoplasia. Hypertension seldom complicates renal hypoplasia.

#### RENAL TUMOUR

The relative incidence of hypertension in cases of renal tumour ranks next to that occurring with atrophic pyelonephritis. It is evident that the age factor must be considered in this group of cases, since 87, or 63.5 per cent, of the patients were fifty years of age or more. It should be stated that the blood pressure was elevated only moderately (160 mm. or less) in 19, or 50 per cent, of the 38 cases in which the blood pressure was studied. Since the blood pressure returned to normal following nephrectomy in many of these cases, it would seem probable that either some substance secreted by the renal neoplasm itself was an etiological factor or a pressor substance was secreted in the unininvolved portion of the kidney.

#### RENAL CALCULI

It may be inferred that renal lithiasis is not necessarily an etiological factor in hypertension, since the incidence of hypertension was found to be no greater among patients with renal lithiasis than it was in an equal number of patients selected from the clinic's registration. When, however, infection develops, with subsequent areal vascular sclerosis, the incidence of hypertension rises abruptly. Hypertension was observed in only 3 per cent of the cases of renal lithiasis in which infection was not present, while it occurred in 37 per cent of cases in which infection was present. The number of pus cells found in the urine in no way indicated the presence of hypertension. It occurred as often in cases in which there were comparatively few pus cells as it did in cases in which the urine was cloudy. In other words, it is apparently the extent to which cicatricial changes resulting from infection affect the blood vessels in the area involved which matters, rather than the degree of infection. It has been suggested that the existence of disease in the opposite kidney in cases of unilateral renal lithiasis possibly may account for the hypertension. Against this, however, is the fact that in many cases no evidence of disease could be found in the opposite kidney by the clinical methods available. Furthermore, the incidence of hypertension in cases of bilateral renal lithiasis was no greater than in cases of unilateral lithiasis.

#### HYDRONEPHROSIS

Hypertension was found in only 51, or 18.6 per cent, of 372 patients operated on for hydronephrosis. Hypertension was observed in only 7.7 per cent of the cases of hydronephrosis in which the patients were under fifty years of age. However, when the blood pressure of a patient with hydronephrosis who is under fifty years of age is definitely elevated, it becomes a matter of clinical significance and must be given careful consideration. In none of these cases was the drop in blood pressure more striking than that which occurred following nephrectomy for hydronephrosis. It is of interest that the degree of pyelectasis apparently was not a factor, since there was no difference in the incidence of hypertension in cases in which pyelectasis was grade 1 or 2 and in cases in which it was grade 4.

#### RENAL TUBERCULOSIS

The low incidence of hypertension among patients with renal tuberculosis is notable. It was

present in but 7.6 per cent of 158 cases. It is evident that in cases of renal tuberculosis the pathological changes in the renal parenchyma are not conducive to the secretion of a pressor substance. Hypertension might be expected to occur as a result of the extensive atrophic changes which take place in the tuberculous kidney which becomes non-functioning as the result of occlusion or caseation. However, hypertension occurred in only 5, or 13.5 per cent, of a group of 37 such cases. There was no drop in blood pressure among the patients with non-functioning tuberculosis who were subjected to nephrectomy.

#### POST-OPERATIVE HYPERTENSION

One of the most interesting results of this study of cases in which hypertension was associated with a surgical lesion of the kidney has been the disclosure of a group of cases in which hypertension developed following operation on the kidney. In a group of 14 cases the blood pressure was normal prior to conservative renal operation, and hypertension developed in a variable period of time afterward. Post-operative examination in these cases showed evidence of a reduced renal function and infection in the kidney subjected to previous operation, while the opposite kidney was found to be normal. Following removal of the affected kidney the blood pressure became normal in all of the cases studied. Examination of the removed kidney usually disclosed evidence of widespread tissue atrophy and vascular sclerosis, which apparently had resulted from operative trauma and secondary infection. The operations which were performed previously were as follows: nephrolithotomy, plastic operations for hydronephrosis, nephrostomy for renal drainage, ureterolithotomy, nephropexy, repair of ureterovaginal fistula following hysterectomy, repair of persistent vesicovaginal fistula, and sigmoidal implantation of ureters. A post-operative increase in blood pressure apparently occurs more frequently following conservative operation for renal and ureteral lithiasis than other lesions.

#### RENAL INJURY

Renal ischaemia as a cause of hypertension was observed in only two of 30 cases in which ischaemia was observed at varying lengths of time following severe renal injury. It might be surmised that cicatricial changes following renal

injury might eventually cause hypertension, but a review of such cases at the clinic shows that no change in blood pressure is noted in most cases. It may be inferred, therefore, that most cases of renal injury will not be followed by sufficient cicatricial alterations to cause hypertension.

#### CHRONIC BILATERAL PYELONEPHRITIS

Chronic bilateral pyelonephritis is not included in the list of renal lesions amenable to surgical treatment because both kidneys nearly always are involved to an equal degree. A recent study by Braasch and Jacobson<sup>7</sup> showed that the incidence of hypertension in cases of chronic bilateral pyelonephritis is only slightly higher than the average. In fact, the incidence of hypertension is increased only moderately, even in cases of long standing pyelonephritis. In most cases of chronic pyelonephritis the degree of hypertension remains comparatively low, even late in the disease. It is evidence that chronic bilateral pyelonephritis does not necessarily cause the type of vascular lesion that produces hypertension.

Surgical therapy is indicated only when unilateral complications develop, such as exacerbation of infection, pelvic stasis, or lithiasis causing intrarenal vascular imbalance. When hypertension occurs in a young adult who has chronic pyelonephritis, the possibility of a unilateral surgical kidney should be excluded. This would be particularly true if the hypertension was of recent origin. In some cases there may be difficulty in determining whether operation is indicated if the function of one kidney is only moderately reduced and if there is only slight rographical deformity.

#### COURSE OF BLOOD PRESSURE AFTER OPERATION

The post-operative course of the blood pressure was followed in 372 cases in which surgical operation was performed on the kidney. All the patients were traced for at least six months, the majority of them for more than a year and, in several instances, for as long as five years. Pre-operative hypertension had been observed in 198 of these cases and the pre-operative blood pressure was normal in 174 cases. Hypertension was permanently relieved by surgical operation for various renal lesions in 65, or approximately a third, of the 198 cases. Hypertension in the presence of surgical lesions of the kidney was

relieved more often by nephrectomy than by conservative operation.

In 17 cases there was a post-operative drop in blood pressure, but the hypertension returned within a few weeks or months after operation. A temporary drop in blood pressure, occurring immediately after operation, often is caused by rest in bed and removal of a toxic irritant. In several cases the blood pressure remained normal as long as two years after operation and then returned to the pre-operative level. In such cases it may be inferred that primary hypertension existed and had been temporarily increased by a surgical renal lesion. In order to determine the permanent result of the operation it is necessary to observe the patient's blood pressure for at least two years.

In a group of cases of hypertension in which the patients are carefully selected for renal operation, the number of cases in which the blood pressure will be restored to normal and remain so for a year or more following operation unfortunately will be very small. Even so, one patient whose blood pressure is restored to normal by renal operation would justify a vast amount of clinical search and investigation. It is difficult to find a group of patients who are more appreciative of the benefits they have received than are patients who apparently have been cured by this procedure.

#### SUMMARY AND CONCLUSIONS

1. A unilateral, non-nephritic, or "surgical" lesion of the kidney is not a frequent cause of hypertension. A review of our records at the clinic shows that the incidence of such lesions among patients with hypertension who are amenable to operation is less than 1 per cent.

2. Surgical removal of a unilateral renal lesion when present will often relieve hypertension.

3. Urographical evidence of deformity in the urinary tract does not always signify that the renal lesion is an etiological factor in cases of hypertension. Many deformities have no clinical significance. Further urological examination is necessary for exact interpretation.

4. The discovery of a unilateral renal lesion in the presence of hypertension does not indicate that operation is advisable in every case, since other factors often are present which would contraindicate it.

5. No specific type of renal lesion is observed with hypertension. The essential factor is ap-

parently an intrarenal vascular imbalance which permits the secretion of pressor substances.

6. The renal lesion amenable to surgical treatment which occurs most often in association with hypertension is chronic unilateral pyelonephritis in either its diffuse, atrophic, or post-operative forms.

7. Acute cortical renal infection or peri-nephritis abscess seldom is a factor in causing hypertension.

8. The presence of renal stone or hydronephrosis will not affect blood pressure unless a secondary pathological change in the renal tissue causes intrarenal vascular imbalance.

9. The rôle of secondary infection is important, since hypertension occurred in many cases in which such infection was manifest. However, the deciding factor apparently is not the degree of infection but the consequent lesions in the renal parenchyma which cause intrarenal secretion of pressor substances.

10. The degree of pyelectasis and back pressure did not seem to be a factor, since the incidence of hypertension was no greater in cases in which pyelectasis was grade 4 than in cases in which it was grade 1.

11. Hypertension was observed less frequently in the presence of renal tuberculosis than as an accompaniment of other forms of surgical kidney.

12. Bilateral renal involvement, such as occurred in many cases of renal lithiasis, hydronephrosis and renal tuberculosis, was not an etiological factor in hypertension.

13. Hypertension may develop after a previous conservative renal operation. In many cases the blood pressure becomes normal after removal of the affected kidney. In every case of hypertension in which there is a history of previous operation, the etiological possibility of post-operative renal changes must be considered.

14. A follow-up study was made in 198 cases in which hypertension was present and in which surgical operation was performed. The blood pressure became normal after operation in 65, or a third, of the cases and remained normal for a year or more.

15. Reduction in blood pressure may exist as long as a year or more after operation and yet hypertension may return. In order to determine whether recovery after operation is permanent it is necessary to determine the patient's blood pressure for more than a year.

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## RÉSUMÉ

Un rein "chirurgical", non-néphrétique, unilatéral est très rarement en cause dans l'hypertension, (moins de 1 pour cent des cas). Cependant, lorsque cette cause existe, sa suppression soulage parfois l'hypertension. Les déformations rénales visibles à la radio n'ont de signification que si elles sont contrôlées par un examen urologique minutieux. Une lésion rénale unilatérale avec hypertension ne sera opérée que si tous les autres facteurs d'hypertension sont éliminés. Il n'existe pas de lésions rénales spécifiques de l'hypertension; la pyélonéphrite unilatérale chronique est peut-être l'association la plus fréquente. Les infections corticales et les abcès péri-néphrétiques, les calculs et l'hydronéphrose ne sont pas habituellement générateurs d'hypertension. Le rôle de l'infection secondaire est discuté et est attribuable à des lésions du parenchyme causant la sécrétion intrarénale d'agents pressors. La pyélectasie et la tuberculose rénale n'ont pas d'action hypertensive; il ne est de même de la lithiasis. L'hypertension suit parfois une opération rénale conservatrice; dans ces cas, pour attribuer quelque valeur à l'opération la tension artérielle devra demeurer normale pendant au moins un an. JEAN SAUCIER

## THE INTRACRANIAL USE OF SULFADIAZINE: EXPERIMENTAL STUDY OF THE HISTOLOGY AND RATE OF ABSORPTION\*

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RECENT experimental<sup>1, 2</sup> and clinical reports<sup>2, 4, 13</sup> indicate that sulfadiazine has a bacteriostatic action upon a wider variety of organisms than sulfanilamide, sulfapyridine or sulfathiazol. It has repeatedly been pointed out<sup>3, 6, 8</sup> that by applying drugs of the sulfonamide group locally one gains the important advantage of a high concentration at the point of infection or contamination and a relatively low concentration elsewhere. Sulfadiazine may prove to be the drug of choice for local application.

This histological and chemical study of sulfadiazine is similar to that made recently of sulfathiazol, sulfanilamide and sulfapyridine,<sup>7</sup> and the results obtained may be used to compare certain properties of these drugs following local application to cerebral wounds.

Under aseptic conditions an area of cerebrum 0.5 to 1 em. in diameter was excised by use of the suction. The electrocautery was not used in these wounds, nor were silver clips or sutures introduced. Haemostasis was accomplished by avoiding larger vessels and waiting for spontaneous thrombosis in smaller vessels. In this way the effects of elements, other than the drug in question, were not introduced into the wound.

A total of nine cats was used in this experiment. In five animals which were to be used to determine the rate of absorption, the cerebral wound containing the drug was carefully covered with amnion to prevent washing away of the drug by the cerebrospinal fluid. The dura was finally closed as tightly as possible. The animals were sacrificed at intervals indicated on the Table. The method of extraction and chemical analysis described by Maher and Camp<sup>10</sup> was used to determine the amount of drug which remained in the brain. Trichloroacetic acid was substituted for 95 per cent alcohol as the agent to extract the drug from the brain. (Solubility of sulfadiazine in 95 per cent alcohol = 67 mg. per 100 c.c.; in 15 per cent trichloro-acetic acid = 273 mg. per 100 c.c.). Many controls were done and the accuracy of the method is indicated by several of these shown on the chart.

In the four animals which were to be used for histological study no amnion was inserted. The dura was carefully closed and the animals autopsied after four, fourteen, twenty, and thirty days. Sections were taken through the wounds and a careful study of the adjacent cerebrum and meninges was made. In every instance there was but a typical interstitial reaction to circumscribed trauma and this did not exceed that seen in similar wounds without

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Cat No. or Control No.	Amount of drug inserted	Days post-operative before autopsy	Amount of drug detected	Amount of drug absorbed
Cat No. 2627	150 mg. sulfanilamide	11 days	less than 1/100 mg.	150 mg.
Cat No. 2613	80 mg. sulfathiazol	17 days	less than 1/100 mg.	80 mg.
Cat No. 2620	140 mg. sulfathiazol	11 days	32 mg.	108 mg.
Cat No. 2609	80 mg. sulfapyridine	8 days	32.5 mg.	47.5 mg.
Cat No. 2620	110 mg. sulfapyridine	11 days	25 mg.	85 mg.
Cat No. 2613	70 mg. sulfapyridine	17 days	5.8 mg.	64.2 mg.
Cat No. 2615	110 mg. sulfapyridine	25 days	2.4 mg.	107.6 mg.
Cat No. 2616	105 mg. sulfapyridine	34 days	less than 1/100 mg.	105 mg.
Cat No. 2880	70 mg. sulfadiazine	8 days	29.1 mg.	40.9 mg.
Cat No. 2889	60 mg. sulfadiazine	15 days	5.15 mg.	54.85 mg.
Cat No. 2879	70 mg. sulfadiazine	23 days	less than 4/10 mg.	70 mg.
Cat No. 2915	120 mg. sulfadiazine	25 days	3.73 mg.	116.27 mg.
Cat No. 2842	65 mg. sulfadiazine	36 days	less than 4/10 mg.	65 mg.
Control No. 1	2.1 mg. sulfadiazine	0	1.95 mg.	
Control No. 2.	0.4 mg. sulfadiazine	0	0.315 mg.	
Control No. 3	5.0 mg. sulfadiazine	0	4.05 mg.	

The values for sulfanilamide, sulfathiazol and sulfapyridine are republished here from a previous experiment<sup>7</sup> for comparison with sulfadiazine.

the application of chemicals. Well preserved nerve cells could be seen very near the margin of the wounds. In the fourteen-day specimen there were a few foreign body giant cells present beneath the meninges but these were entirely absent in the twenty-day specimen.

#### DISCUSSION

The amount of drug used and the method of application to the wound in these experiments was somewhat different from that recommended for clinical use. Undoubtedly when a thin coat of the dry powder is blown over the wound, absorption is completed much earlier than when

the wound is packed full of the drug. Even under the latter condition the amount of reaction is negligible and does not approach that of such foreign bodies as silk suture material and silver clips.

The value of the results obtained for the rate of absorption lies in the fact that conditions were as nearly identical as possible for the various drugs. These results show accurately the relative rates of absorption. This may be useful in deciding which drug to choose for local application. In a small wound of recent origin where infection has not yet had time to become well established one might choose a drug which will be absorbed rapidly. If, however, there is a chronic source of infection as in those wounds communicating with the paranasal sinuses it would seem logical to use a drug which will remain longer, especially if one application must suffice. In wounds which present a large absorbing surface (burns) there is less chance of toxic blood levels occurring if one chooses a drug

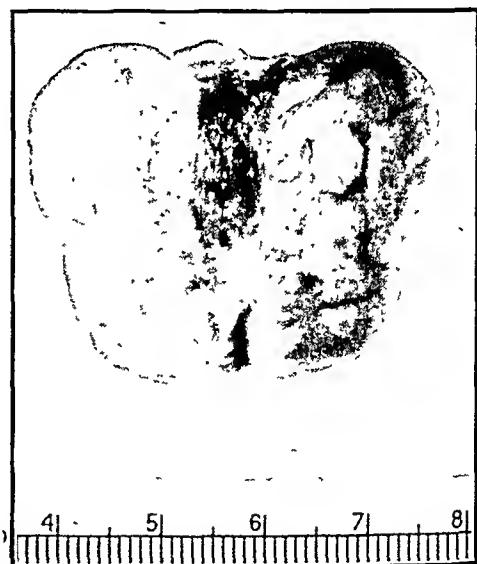


Fig. 1.—Photograph showing unabsorbed sulfadiazine in cortical wound eight days after application.

which is absorbed slowly. Finally one should when possible select the drug having the highest degree of bacteriostatic action upon the type of bacteria present.

There would seem to be good reason to use a mixture of several of these drugs in certain instances, thus combining these specific properties. Sulfathiazol with sulfanilamide as recommended by Hawking<sup>6</sup> or perhaps better still sulfadiazine with sulfanilamide will satisfy most

conditions. A high concentration of sulfanilamide will result immediately. A high concentration of sulfadiazine will persist for a time sufficient to cope with latent infection and infection due to a wider variety of organisms possibly including gas bacillus.<sup>9</sup> If this mixture is used as a dry powder and a thin even film sprayed over the lacerated brain, sulfanilamide will persist for less than 11 days; sulfadiazine for less than 23 days.

It is imperative to bring the drugs in contact with every recess of the wound which might harbour infection. This is best accomplished by use of the powder blower. They will finally reach inaccessible tissue spaces by diffusion after they are dissolved in the serum of the wound.

The importance of using care in applying these drugs in various vehicles and solvents cannot be over-emphasized. The high pH of the sodium salts of these drugs results in local tissue destruction and will cause degeneration of nervous parenchyma over large areas. It is entirely possible that some other substances form compounds with sulfonamides, which upon absorption from the surface of a wound cause toxic symptoms. The fatalities which resulted from the administration of "elixir of sulfanilamide" are but too vivid in our memory. Used properly, however, in conjunction with good surgery there is reason to believe that drugs of the sulfonamide group are proving themselves extremely valuable as local bacteriostatic agents<sup>1,8,11</sup> and are indispensable in military neurosurgery.<sup>12</sup>

#### SUMMARY

1. Following local application to a cerebral wound there is considerable difference in the rate of absorption of several drugs of the sulfonamide group as determined by extraction and chemical analysis. Sulfanilamide is the most rapidly absorbed, sulfathiazol second, sulfadiazine third and sulfapyridine is the least rapidly absorbed.

2. Sulfadiazine when in contact with meninges or cerebral parenchyma causes no neuronal destruction, no glial reaction and but a negligible foreign body reaction in the meninges.

3. Sulfadiazine exercises no untoward effect upon the final result of wound healing.

The writer expresses his appreciation for the kind assistance rendered by Miss Doris Brophy of the Department of Chemistry (Montreal Neurological Institute) and Miss H. Thompson of the Medical Laboratories (Royal Victoria Hospital). Technical advice was given by Dr. Donald McEachern and Dr. M. E. S. Hunter of these respective Departments.

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#### A Physician's Prayer

Lord, Who on earth didst minister  
To those who helpless lay  
In pain and weakness, hear me now,  
As unto Thee I pray.  
  
Give to mine eyes the power to see  
The hidden source of ill,  
Give to my hand the healing touch  
The throb of pain to still.  
  
Grant that mine ears be swift to hear  
The cry of those in pain;  
Give to my tongue the words that bring  
Comfort and strength again.  
  
Fill Thou my heart with tenderness,  
My brain with wisdom true,  
And when in weariness I sink,  
Strengthen Thou me anew.  
  
So in Thy footsteps may I tread,  
Strong in Thy strength alway,  
So may I do Thy blessed work  
And praise Thee day by day.

—By an unknown author,  
*The Diplomat*, November, 1941.

## THE CLOSED PLASTER TREATMENT OF RECENT MASTOID WOUNDS

By JOHN GERRIE, MAJOR, R.C.A.M.C.

*Montreal*

THERE is now general acceptance of Trímeta's, or probably more correctly Winnett Orr's, closed plaster method of treating osteomyelitis, open fractures and bone injuries. The application of these principles in other types of wounds has yet to be attempted. The following short note is an account of such an attempt. It was limited in extent, and not very conclusive, but it may be considered worth recording for the guidance of others.

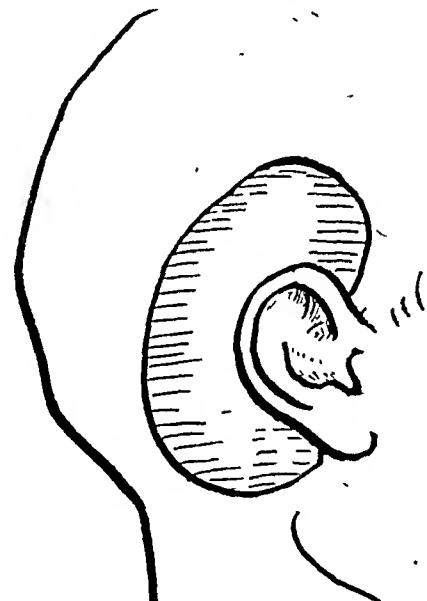
In the fall of 1940 it happened that a series of some twenty cases of mastoiditis came under my charge at No. 1 Canadian General Hospital in England. They were all young children, ranging from 3 months to 12 years. They had been treated in Birmingham hospitals, whence they were evacuated after a bombing raid. All had recent mastoidectomy wounds, two having had their operations on the morning of their evacuation to our hospital.

Incidentally, here was the interesting spectacle of a Canadian military hospital, without cribs, diapers or feeding bottles and its nursing sisters not yet arrived, accepting 150 civilian children for treatment. It was probably something unique in the history of military medicine.

Trímeta had visited our hospital a few days before and had given our officers an excellent evening describing his principles and methods and his experiences in the Spanish war. It occurred to me that a mastoid wound, aside from its middle ear and Eustachian tube connections, was not unlike many of the wounds he described. The elements of fear, pain and tedium associated with frequent mastoid dressings especially in small children, provided me with a further incentive to try a closed plaster technique. Accordingly, a number of cases were selected and their wounds encased in plaster.

About 8 of the children were already well along in their convalescence, the wounds being almost healed, aside from a few exuberant granulations. These cases were rejected, and the remaining 12, which were between 4 and 10 days post-operative, were "plastered". The technique was extremely simple. The deeper

more recent wounds were packed lightly with a "sloppy" vaseline gauze and those in which healing was further along had only a wick of the gauze and received the raw plaster on top. No hair-shaving, further than the original mastoid preparation was felt necessary and the plaster held well to this several-day-old stubble. Ordinary bandage plaster was used, four to five ounces of a thick, creamy mixture about the



consistency of waffle batter being sufficient for one dressing. The ear was pulled forward and the plaster dropped on, in a semi-circle extending about a three-inch radius behind the ear and to a depth of about one-quarter of an inch. A narrow flange was extended above the ear on to the zygomatic region for the purpose of further retention but I do not think this was necessary.

The plaster was left on for periods ranging from 10 to 14 days and removed only when it was felt that healing was well along. No complications were encountered. Clinically the children were well, with no rises in temperature and much happier in the absence of frequent dressings. The plasters held well, no bandages being required. One case was bilateral. The ear canals were continuously open for inspection. I felt that discharge was some-

what less than in the average mastoid case. In only three was there any discharge from the ear canals. In only two cases was suppuration profuse, and mucopurulent material seeped down under the plaster. This was caught by absorbent pads. All the plasters stained, but none were offensive. The skin was somewhat excoriated in the cases with heavy discharge, but this cleared quickly following the removal

of the plaster. Removal was easy, causing no distress to the child.

It is difficult to say, from such a small, uncontrolled series of cases, whether this procedure aided in healing to any marked extent. I felt that it was at least as good as it would have been in a similar series receiving orthodox treatment, and it had the added, not inconsiderable, advantage of infrequent dressings.

## THE LOWER UTERINE SEGMENT: ANATOMICAL CHANGES DURING PREGNANCY AND LABOUR\*

By P. J. KEARNS

*Montreal*

IN reviewing the pathological specimens listed in our obstetrical and gynaecological museum at McGill University my interest was drawn to the relative frequency of damage to the lower uterine segment during labour. I proceeded to examine these specimens and study the anatomical changes in the lower uterine segment during pregnancy and labour and to correlate the incidence of traumatic defects in this section of the uterus.

The necessity of a threefold division of the uterus into corpus, isthmus and cervix must be accepted. Since the lower uterine segment takes in the cervix canal plus the isthmus, we must clearly define what the isthmus is in order to separate its relative anatomical alterations from those of the cervix canal.

The isthmus, as described by O. Frankl, is the hollow space in the cranial part of the cervix, the mucous membrane of which resembles that of the corpus without being identical with it morphologically or physiologically. It is not the circular border line between the cavity of the cervix, as Langer called it long ago. Aschoff denominates the "orificium uteri internum anatomicum" as the border line between the corpus and the cranial end of the isthmus, and names the caudal aspect of the isthmus as the "orificium uteri internum histologicum". This description, although practically speaking correct, is subject to alteration because the orificium isthmi anatomicum does not always coincide

exactly with the entrance of the uterine artery or reflection of peritoneum. The histological border between cervix canal and isthmus is also ill defined because some of the cervical glands lie intermingled in the stroma of the isthmus at this junction. For these reasons the Nomenclature Commission of the Anatomical Society replaced these terms by "orificium isthmi internum" and "orificium isthmi externum". Because the anatomical internal os as designated by entrance of the uterine artery does not always coincide with the entrance of the uterine artery or reflection of peritoneum by a millimetre it is doubtful if these terms are more comprehensible than those used by Aschoff.

An examination of our premenstrual endometria and those of glandular hyperplasia clearly demarcates macroscopically the position of the isthmus. The orificium isthmi internum certainly is at variance with the position of the entrance of the uterine artery and reflection of peritoneum. The average length of such isthmi in the non-pregnant uterus is about 0.5 cm. long but is lengthened in accordance to enlargement of the uterus, as is noticed in hormonal hyperplasias of myometrium and in physiological enlargement of the young pregnant uterus.

### DEVELOPMENT OF THE LOWER UTERINE SEGMENT

The presence of a lower corpus sphincter is seen in practically all mammals or in those species which develop a corpus luteum. In the uteri which produce segmental pregnancies, such as the pig, a hypertrophied bundle of oblique and transverse fibres constricts each segment at its caudal pole and separates each ovum into its

\* Delivered at the Seventy-second Annual Meeting of the Canadian Medical Association, Winnipeg, June 25, 1941.

A number of illustrations have been omitted for lack of space.

own chamber. A section from the pregnant uterus of a pig shows this point nicely. The main uterine artery for that segment lies medial to this sphincter muscle bundle as is seen in the human (Fig 1).

The development of a corpus sphincter in the human female appears about the fourth month of intrauterine life, and is formed by a down growth of Muellerian mesoderm meeting an up-growth of mesodermic fibres from the lateral intero-vaginal tube, where the vault of the vagina is being formed. This growth behaviour con-



Fig. 1

Fig. 3

fuses the fibres; some are pushed obliquely, some transversely, while others lie intermingled, thus forming the corpus sphincter ring which lies slightly above and external to the entrance of the uterine artery (Fig. 2). As the corpus uteri grows, so does the sphincter ring. A full term fetus shows a well-formed internal sphincter ring and cervix, yet the corpus is relatively small.

#### THE BLOOD SUPPLY OF THE LOWER UTERINE SEGMENT

Since the isthmus lives its own life, independently of hormonal and tissue changes of the corpus, one would expect that the isthmus would have its own independent blood supply and that the provision of vessels for the isthmus should be recognized as an individual and separate one. The finding of a special ramus isthmicus is uncommon, but upon attentive observation the shorter, more direct, transversely running branches of the isthmus can be contrasted with the upward striving of corpus branches and the downward striving of cervical ones to the cervix.

The distinct provision of a proper group of vessels springing from the arteria uterina is in harmony with the individual physiological life of this section of the womb. During the first two months of pregnancy numerous new branches from this system are created giving the lower uterine segment a very rich circulation (Fig 3).

#### THE NERVE SUPPLY TO THE LOWER UTERINE SEGMENT

The nerve supply to the lower uterine segment still remains unidentified. Comparative study of other hollow viscous organs enclosed by sphincters, such as the urinary bladder, shows that the para-sympathetic contracts the bladder fundus and dilates the internal sphincter of the urethra, while stimulation of the sympathetic dilates the bladder fundus and constricts the internal urethral sphincter. Evacuation of uterine contents is possibly facilitated similarly, that is, the para-sympathetic contracts the active part of the uterine fundus and dilates the internal sphincter, while stimulation of the sym-

pathetic would dilate the fundus and contract the internal uterine sphincter. Some authors (Best and Taylor, *Physiology*, p. 1533) state that the sympathetic stimulates the uterus in pregnancy and inhibits in the non-pregnant state. The para-sympathetic is not mentioned. This complete reversal of the systems is not universally accepted. Dystocia could be precipitated, therefore, by a superimposed hyperstimulation of the sympathetic fibres of the uterus overpowering the influence of the para-sympathetic system, resulting in a simultaneous constriction of the internal sphincter with an imperfectly dilated cervix os.

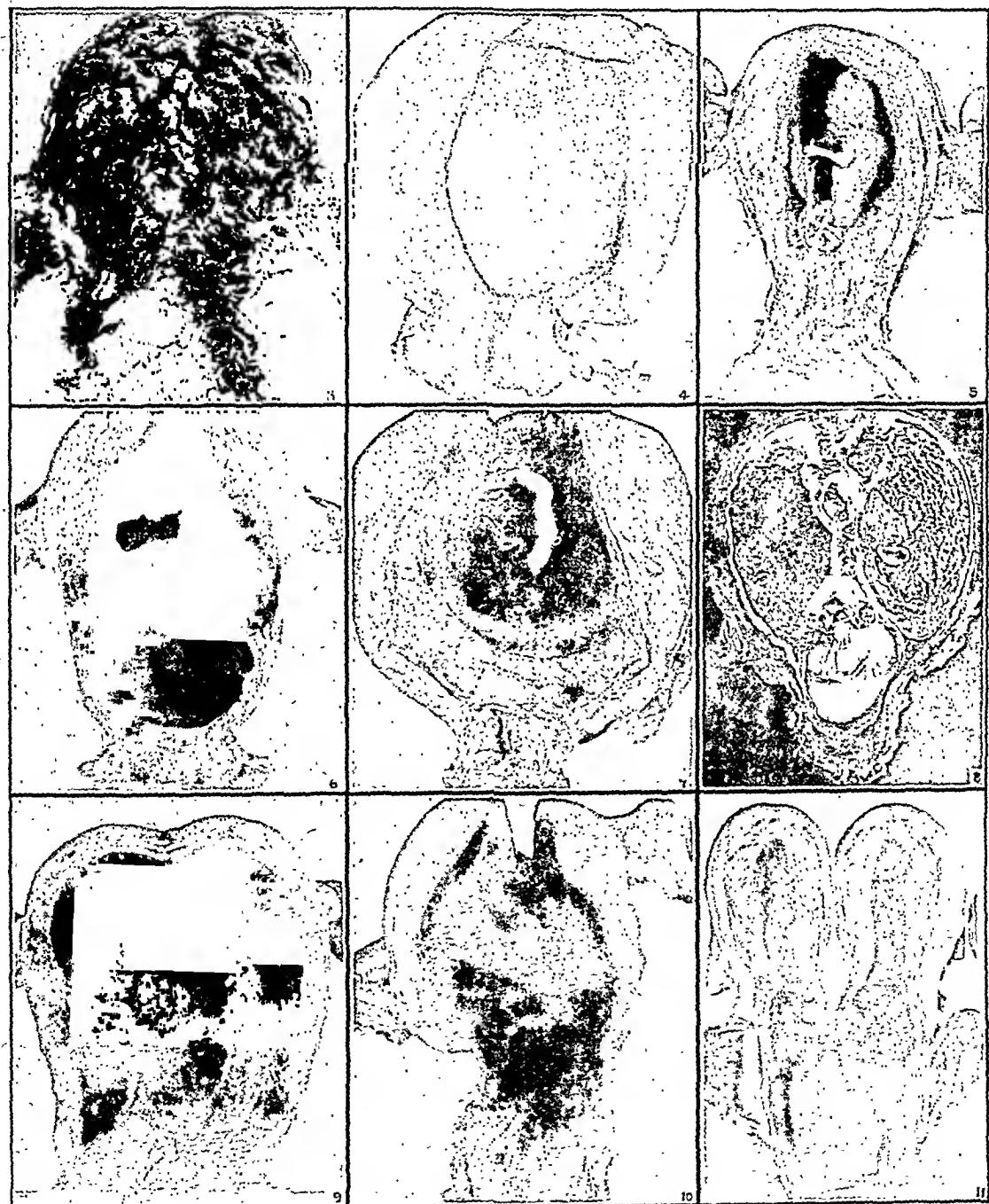
Abnormal hormonal influences could alter the intrinsic powers of these systems precipitating dystocia.

#### FORMATION OF THE LOWER UTERINE SEGMENT IN PREGNANCY

The isthmic part of the lower uterine segment is first noticed being taken into the ovum chamber about the fourth month of pregnancy (Fig. 4). A gradual relaxation of the internal

os and sphincter ring occurs. The isthmic mucosa which is not truly decidualized prevents adherence of the chorion in this region. The pliancy to expand is also lubricated by the thick, gelatinous, cervical mucus which is being secreted in large quantities. By the fifth month of pregnancy the entire isthmic part of the lower uterine segment forms the caudal lateral part of the ovum chamber and the cervical canal is

now expanding from above downwards in wedge-shaped fashion, its upper walls being taken into the ovum chamber (Fig. 2). At the eighth month of pregnancy about half of the cervix canal is incorporated into the lower uterine segment (Fig. 6), and at full term only about the lower third of the cervix canal, plus the external os, remain to be dilated in the first stage of labour (Fig. 7). In high, imperfectly-



fitting presentations, as in generally contracted pelvis, android pelvis with posterior position, breeches more of the cervix remains to be dilated causing prolonged first stages of labour. As the external os and the lower third of the cervix canal are dilated during labour, their inner walls are gradually taken into the ovum chamber and cannot be distinguished from the upper lateral walls of the lower uterine segment (Fig. 8).

#### FUNCTIONS OF THE INTERNAL UTERINE SPHINCTER

The part played by the uterine sphincter in the non-pregnant state is merely one of position and sphincteric action, by first enclosing the mucous plug of the cervix; secondly, the uterine sphincter gives shape to the cervix in its cephalic pole; thirdly, it separates infections of the cervix canal from the uterine cavity and, fourthly, it prevents the ovum from falling into the cervical canal. In early pregnancy it continues to act as the internal sphincter until the third month of pregnancy, when it begins to relax. During the last month of pregnancy it supports the ovum chamber in its lower middle third and prevents over-distension of the lower uterine segment by direct pressure. During labour it is the lifeguard to prevent over-distension and rupture of the uterus in its weakest part, the isthmie region.

#### PATHOLOGY OF THE LOWER UTERINE SEGMENT IN PREGNANCY AND LABOUR

Because the internal uterine sphincter ring remains closed until about the third month of pregnancy it offers a barrier, a ledge, to the upper limits of a relatively long cervix canal. This ledge obstructs the passage of instruments, and frequently the dilator passes through the side wall of the uterus below it. After the fourth month this danger is lessened. Dysfunction in the lower uterine segment may be caused by confused innervation hypereonstricting the internal sphincter and creating a constriction ring, "Bandl's ring", and preventing the proper descent of the baby during labour. In long drawn-out labours, as is seen in posterior positions, breeches, versions, transverse positions, the corpus muscle retracts drawing Bandl's ring upward,

ward, creating a thinned-out muscle below it. The lower uterine segment now comprises a part of the uterine cavity, the isthmus and cervix canal. This rapidly-formed portion of the lower uterine segment is not educated to strain as is the lower uterine segment proper which has formed over months of preparation. Because of the unprepared blood and nerve supply it offers little resistance to strain; therefore, this area is a most likely site for rupture. Practically all our ruptures of the uterus in labour have begun in this pathologically-formed area at the upper border of the true lower uterine segment. These tears may extend downward to or through the cervical os, or may only fracture the lower uterine segment, tearing a branch of the uterine artery with uncontrollable haemorrhage (Figs. 9, 10 and 11).

#### THE LOWER UTERINE SEGMENT IN THE THIRD STAGE OF LABOUR

The part played by the lower uterine segment during the third stage of labour is merely a passive one. I illustrate the normal anatomical picture of the lower uterine segment in the third stage of labour by presenting a picture of a uterus\* which was removed at autopsy from a woman who died from miliary tuberculosis at the end of the second stage of labour, the birth of her baby. The placenta remained in the lower uterine segment. The picture is similar to that seen during the passage of the child through the cervix, except that it has shortened longitudinally. From the study of this specimen I emphasize the rationale of pulling the fundus away from the placenta as it passes through the lower uterine segment rather than flattening the lower uterine segment by fundal pressure. Grasping the uterus through the lower uterine segment, above the pubes, and carrying the fundus slightly upward allows for better return of contraction in this area. The same purpose may be defeated by firmly packing and distending the lower uterine segment in attempting to control uterine post-partum haemorrhage. Shock frequently follows trauma or abnormal distension in the lower uterine segment.

\* This refers to an illustration presented at the Annual Meeting.

## THE BACTERIOLOGY OF RECENTLY INFILCTED WOUNDS WITH SPECIAL REFERENCE TO THE HÆMOLYTIC STREPTOCOCCI AND STAPHYLOCOCCI

BY RONALD HARE AND REBA E. WILLITS\*

Toronto

IT has been suggested in previous papers (Hare, 1940, a, b, 1941, Hare and Willits, 1941) that pathogenic strains of hæmolytic streptococci are probably not introduced into wounds at the time of infliction but some time later. This hypothesis was put forward on the basis of studies which showed how rare these organisms are on the objects which cause wounds, or which may enter them at the time of infliction. This evidence is largely negative, and another and possibly more direct way to test the truth of this hypothesis would be to study freshly-inflicted wounds bacteriologically and establish whether or not hæmolytic streptococci of pathogenic groups are ever present.

In previous studies on the bacteriology of freshly-inflicted wounds, notably those of Sas (1929-30), Dimitza and Gntscher (1933) and Sviridov (1936) streptococci were isolated comparatively often but it is impossible to gather from their description what varieties were encountered. In a more recent paper, however, Pulaski, McInney and Spaeth (1941) found that of 200 wounds sampled soon after infliction, 12.5 per cent had aerobic hæmolytic streptococci, and 4.5 per cent microaerophilic hæmolytic streptococci in them, but no attempt was made to classify the organisms further.

In the investigation reported in this paper, wounds were cultured within two hours of infliction, before anything whatever was done to them. At first our attention was devoted entirely to the search for hæmolytic streptococci, but when it became obvious that these organisms occurred much more infrequently than we had expected, we turned our attention to the staphylococci as well.

The serological group and type of all strains of hæmolytic streptococci isolated were determined, there being an overwhelming body of evidence that only Group A strains need be seriously considered as human pathogens. In

the case of the staphylococci, ability to form coagulase has been shown by Chapman *et al.* (1934) Fairbrother (1940) and others to serve a somewhat similar function.

Mere sampling of the wounds after infliction without further study during the period of healing is of little value. For this reason, an attempt was made to obtain bacteriological material from as many wounds as possible during convalescence, and particularly those in which there was any evidence of infection. Careful notes were also made of the clinical progress of the cases. For a variety of reasons, this was not always possible, but the attempt was certainly made. If hæmolytic streptococci subsequently appeared in the wound, efforts were made to trace the possible sources of the organisms by bacteriological examination of all the contacts.

### METHODS

*Collection of material.*—The emergency wards of the four teaching hospitals in the city of Toronto and the first aid stations of two industrial plants were provided with labelled sterile tubes containing a small plug of nutrient agar into which was plunged an ordinary straight throat swab mounted on a wooden stick. The agar was used to prevent drying of the material on the swab between collection and culture. The wounds were generally swabbed immediately on the arrival of the patient by intern or nurse and, in any event, before treatment was instituted. While the personnel were individually instructed that the whole of the raw area was to be sampled and so far as we have been able to ascertain this was actually done, it is quite possible that this may have been only perfunctorily carried out in a number of cases. The swab was returned to the tube, plunged into the agar and wherever possible stored in the ice box. The swabs were collected daily, Sundays included, by one of us so that the samples had never been stored for longer than 24 hours. The investigation was begun on July 1, 1940, and the collection of material ceased in May, 1941.

*Type of wound examined.*—As far as possible all patients admitted to the emergency departments with a laceration comparable to a war wound were investigated. For the most part, wounds too small to require suture were not sampled. This ruling could not be applied to the wounds in the industrial plants, many of which were small and trivial. For these reasons, there is undoubtedly an unduly high proportion of small wounds in our series.

*Records.*—Comprehensive records were kept for each patient which included the site of the wound, time interval between infliction and sampling, treatment given, previous history or contact with streptococcal infection, and the names of all those who attended the wound.

\* Working with a grant from the National Research Council of Canada.

From the Connaught Laboratories, University of Toronto.

*Bacteriological examinations.*—On arrival at the laboratory the swab were rubbed first in a tube containing 5 c.c. of infusion broth containing 10 per cent inactivated horse serum. The swabs were then placed in a similar tube of horse serum broth containing 1 in 500,000 gentian violet (Gard, 1933) and the tubes were then incubated for 24 hours or, if no growth appeared, for 48 hours.

A loopful of each culture was then seeded on to two sheep's blood agar plates, one of which was incubated aerobically and the other anaerobically in a McIntosh and Phillips jar. At the end of 24 hours they were carefully examined. Colonies of haemolytic streptococci and staphylococci were isolated and purified by plating. As a rule only one colony of haemolytic streptococci was preserved by subcultivation on blood agar slopes unless there was suspicion that more than one variety was present. In the case of the staphylococci, it was quite usual to find colonies which differed considerably in colour. One colony of each variety was then preserved in Robertson's meat medium.

#### FURTHER STUDY OF THE STRAINS ISOLATED

*Haemolytic streptococci.*—The serological group of every strain was ascertained by the pipette method described by Lancefield and Hare (1935), the sera having been prepared by us in these laboratories. The type of all group A strains was then determined by slide agglutination, using sera prepared by our colleague, Dr. Frieda Fraser, to whom we are deeply grateful for her assistance.

*Staphylococci.*—All strains isolated during the last six months of the investigation were tested for their ability to form coagulase. Two methods were employed for this test. The first, our own invention, was used merely to weed out the positives; the second, that of Chapman *et al.* (1941), slightly modified by the substitution of plain agar for dextrose agar, was employed to test all those found negative by our method. In our method, a drop of the stored culture was seeded into infusion broth and grown overnight. Equal parts of human blood plasma containing one-tenth of its volume of 3 per cent sodium citrate and the shaken whole cultures were mixed on a paraffined slide, drawn up into a capillary pipette, and sealed. The pipettes were incubated for 3 hours and the contents were then extruded into a beaker of cold water. In the case of positives, the contents emerged as a worm and the negatives as a fluid. The latter were then tested by the method of Chapman *et al.* in which a loopful of growth on plain agar was rubbed into 0.5 c.c. of plasma diluted one in three with saline in agglutination tubes. These were incubated at 37.5° for 3 hours and then at room temperature. They were read at 1, 3 and 24 hours. Positives gave a firm solid clot. A number of strains giving negative results by our method were definitely positive by the second method. We have not investigated the probable reasons for this discrepancy but the first method was only used as a trial because of its simplicity and economy. Those found negative in the second tests have been accepted as such.

#### CONTROL EXPERIMENTS TO SHOW THAT THE METHOD EMPLOYED FOR THE SAMPLING OF THE WOUNDS WAS EFFICIENT

In view of the practical certainty that only small numbers of haemolytic streptococci were probably present, control experiments have been carried out to show that the method employed for sampling the wounds was capable of demonstrating the presence of very small numbers of these organisms.

A series of wounds about 3 to 4 cm. long were made in the muscles of the back of a freshly-

killed rabbit by cutting across the muscles with scissors after the skin had been reflected. Into each wound was introduced 0.2 c.c. of a 1/1,000,000 or 1/100,000 dilution of a broth culture of a group A strain of haemolytic streptococci. The wounds were then left for 10 minutes, by which time the fluid had completely disappeared. They were then sampled in the same way as the accidental wounds in human beings and the swabs treated in the same way. Swabs from other wounds were triturated in broth, blood agar was added, and a pour plate made to ascertain the number of survivors. Other wounds were swabbed in the same way but these swabs were kept for 24 hours on the bench before cultivation. The number of organisms introduced into the wounds was ascertained by the direct explantation of 0.2 c.c. of the dilution actually employed into melted agar. In Table I the results obtained in such an experiment in which all the estimations were carried out in triplicate, are given.

TABLE I.  
RECOVERY OF SMALL NUMBERS OF HAEMOLYTIC STREPTOCOCCI FROM ARTIFICIALLY-INFECTED WOUNDS IN RABBITS

Number of colonies in pour plates inoculated with dilution of culture implanted in the wounds.....	6, 7, 5
Number of colonies in pour plates made from broth in which swabs from wounds had been triturated.....	11, 7, 9
Presence of haemolytic streptococci in broth cultures inoculated direct from the wounds.	+, +, +
Presence of haemolytic streptococci in broth cultures inoculated after the swab had remained at room temperature for 24 hours..	+, +, +

This type of experiment has been repeated 5 times with almost identical results. Similar results were also obtained when haemolytic streptococci were dried *in vacuo* on alundum powder and introduced into the wounds. It would therefore seem that the method is capable of detecting small numbers of haemolytic streptococci artificially introduced into the wounds.

It should also be mentioned that the two media employed, 10 per cent serum broth with or without 1/500,000 gentian violet, are well adapted for the cultivation of small numbers of haemolytic streptococci. This is our own experience as well as that of other workers such as Francis (1941). The gentian violet medium frequently, but not invariably, prevented the growth of staphylococci altogether.

## RESULTS

During the period of study, wounds in 346 patients were examined. Nine of the patients had two separate wounds so that a total of 355 wounds were examined. All were first sampled within 2 hours of infliction and 108 of them a second time during the period of healing. These second examinations were, if possible, carried out 48 hours later, but this period depended on many factors beyond our control. The injuries were sustained in many different ways, 51 per cent being industrial accidents, 33 per cent street accidents and 16 per cent miscellaneous. It should perhaps be mentioned that the great majority of those listed as industrial accidents were not sustained in the two industrial plants co-operating in this work, but were cases sent to hospital from many different plants. The wounds were of varying degrees of severity. The majority were comparatively trivial, such as injuries to the hands and fingers, but there were 51 cases with compound fractures or traumatic amputations. There were four deaths, three from shock or haemorrhage and one from infection.

The results obtained in the examination of the wounds directly after infliction are given in Table II. The different organisms are discussed separately below. No growth was obtained from 40 or 11.2 per cent of the wounds. This is probably due to the fact that over 90 per cent

of the wounds in which this occurred were simple cuts of the fingers or hands. Few wounds of any degree of severity gave sterile cultures.

It should perhaps be mentioned that our method of isolation did not include media or methods suitable for the growth of the strict anaerobes. For this reason, *Clostridium tetani*, the gas gangrene organisms or the anaerobic streptococci were not isolated from any of the wounds but there can be no doubt that some of them were frequently present.

Reference to Table III will show that the subsequent clinical history was known in 172 of the 355 wounds. The remainder were, for the most part, very trivial injuries which did not return to hospital for further treatment. Of the 172, 17 are known to have become infected, giving an attack rate of 9.3 per cent.

*Presence of haemolytic streptococci in wounds immediately after infliction and during convalescence.*—Haemolytic streptococci were cultured twice from the swabs taken within two hours of the injury. The strains isolated were found to be members of group H, a group which is seldom if ever a cause of infection in human beings. The patient in question suffered from two wounds, of the leg and the face, sustained in an industrial accident. These organisms together with alpha haemolytic streptococci were isolated from both wounds. Staphylococci, but no haemolytic streptococci at all, were isolated when the wounds were examined again on the fifth day. The man did not suffer from any ill effects and the wound healed by first intention. No group A strains at all were isolated from the whole of the 355 wounds at the time of infliction.

As already mentioned, Pulaski *et al.* found aerobic haemolytic streptococci in no less than 12.5 per cent of the wounds they examined. It may well be asked why only two strains were isolated from the 355 wounds in the present series. This is probably due to the fact that Pulaski *et al.* confined themselves to wounds requiring excision, and, taking the whole of the material which was excised, cultured it in broth. This in many instances would inevitably contain pieces of skin and sometimes clothing on which haemolytic streptococci are comparatively common. Hare (1941), for instance, found that 6.0 per cent of normal persons had these organisms on the skin of the hands, 7.2 per cent on the skin of the legs, and 4.1 per cent on the trousers. But it is also known that the majority of these

TABLE II.

ORGANISMS ISOLATED FROM WOUNDS WITHIN 2 HOURS OF INFILCTION

Staphylococci alone.....	173
Staphylococci + alpha haemolytic streptococci.....	41
Staphylococci + coliforms.....	2
Staphylococci + Friedländer's bacillus.....	1
Staphylococci + alpha streptococci + Friedländer's bacillus.....	1
Staphylococci + alpha streptococci + Gram positive aerobic bacilli.....	1
Staphylococci + other organisms.....	34
Hemolytic streptococci + alpha streptococci.....	2
Alpha streptococci alone.....	5
Alpha streptococci + other organisms.....	5
Coliforms alone.....	10
Coliforms + other organisms.....	1
Friedländer's bacillus alone.....	1
Other organisms.....	38
No growth.....	40
Total.....	355
Number with staphylococci alone or with other organisms.....	253
Number with alpha haemolytic streptococci alone or with other organisms.....	55
Coliforms alone or with other organisms.....	13
Haemolytic streptococci alone or with other organisms.....	2
No growth.....	40

TABLE III.

SUBSEQUENT HISTORY OF PATIENTS WHOSE WOUNDS WERE SWABBED WITHIN 2 HOURS OF INFILCTION

Organisms in primary swab	No. of wounds	No history	Known history	Survived and escaped infection	Number clinically infected with								Death	
					Staphylococcus		Hæmolytic streptococcus		Other organism		No growth	No bacteriological examination		
					Severe	Mild	Severe	Mild	Severe	Mild		Infection	Other causes	
<i>Before October 1</i>														
Staphylococcus alone or with other organisms	65	22	43	35	3	2	0	2	0	0	1	1	0	0
Other organisms	25	16	9	7	0	0	0	0	0	0	0	0	0	0
No growth	6	3	3	3	0	0	0	0	0	0	0	0	0	0
<i>Coagulase</i>														
<i>After October 1</i>					+/-	+/-								
Staphylococcus alone or with other organisms														
Plasma coagulase + only	27	12	15	13	1	0	0	0	0	0	0	0	0	1
Mixed + and -	7	3	4	4	0	0	0	0	0	0	0	0	0	0
- only	147	87	60	53	1	1	1	1	1	0	0	1	0	1
Not done	7	4	3	2	0	0	0	0	1	0	0	0	0	0
Other organisms	37	17	20	13	3	0	0	0	0	0	1	0	0	0
No growth	34	19	15	15	0	0	0	0	0	0	0	1	0	1
<i>Totals</i>	<i>355</i>		<i>172</i>		<i>5</i>	<i>1</i>	<i>1</i>	<i>1</i>						
					<i>9</i>	<i>4</i>		<i>2</i>	<i>3</i>	<i>0</i>	<i>3</i>	<i>3</i>	<i>1</i>	<i>3</i>

strains belong to groups B, C or G, which are much less likely to cause infection in human beings than group A. The latter group is very uncommon in these situations. In the present investigation, all types of wound were studied, many of which were clean and uncontaminated by loose skin or clothing.

Bacteriological examinations of the wounds were carried out in 108 during the period of healing. Hæmolytic streptococci, members of group A, were found in 4 wounds at these repeat examinations, none of the patients having had them when examined directly after the injury. Two of the patients suffered from a definite clinical infection, the other two having no signs whatever of infection despite the presence of these organisms. The relevant details of these cases are given below.

H.A.Y.—Injured by catching hand and arm in an ice cream mixer on September 30th. Complete repair under anaesthetic at once. Fever on October 1st with infection of the wound due to hæmolytic streptococci, Type 12. No history of throat infection. The initial swab from wound taken within three quarters of an hour of injury grew staphylococci. A swab taken 36 hours later grew hæmolytic streptococci, Type 12.

Survey of patient on October 3rd.—Throat, hæmolytic streptococci, Type 12. Nose, negative. Hair, skin of face, chest, hand and legs, negative.

Contacts examined on October 3rd.—Emergency department: doctor and one nurse—throats negative. Operating room: at operation: surgeon and 2 nurses—

throats negative; not at operation: 9 nurses—2 throats group F; 2 throats hæmolytic streptococci, Type 12. Ward staff: 2 nurses—throats negative. Other patient in ward: throat negative.

Other possible source.—The throat of patient who preceded him on the table was found to have hæmolytic streptococci Type 12 in it and that he had been suffering from a "cold" at the time of the operation.

Conclusions: only known sources, patient's own throat, two nurses on the operating staff not in direct contact with him and the throat of the patient who preceded him on the table.

W.I.L.—Terminal phalanx of finger crushed on October 16th. Free from infection until October 26th when clinical infection developed with hæmolytic streptococci Type I. Severe infection of throat on October 24th. An initial swab (within 30 minutes) gave staphylococci. Swab on October 22nd: plasma coagulase positive staphylococci. Swab on October 29th: hæmolytic streptococci Type I. Throat of patient on October 29th: hæmolytic streptococci Type I.

Contacts.—Not examined.

Conclusion.—Probable infection from throat which became infected on October 24th.

C.A.D.—Little finger cut on machinery, October 24th. No clinical infection developed. No history of throat infection. Initial swab (within 30 minutes) sterile. Swab on October 25th: gave hæmolytic streptococci Type I. Throat of patient on October 30th, negative. Throats of 2 attendants in first aid room on October 30th, negative. Throat of mother, negative. No other contacts.

Conclusion.—No source for the organisms could be determined.

S.T.E.—Laceration of palm on October 31st. Seven sutures inserted but no signs of clinical infection developed. No history of throat infection. Initial swab (within 30 minutes) staphylococci and *S. viridans*. Swab on November 1st, hæmolytic streptococci Type I. Throat

of patient on November 3rd, haemolytic streptococci Type I. Throats of 2 attendants in the first aid room on November 3rd, negative. No other contacts examined.

Conclusion.—Probable infection from the patient's own throat.

Thus we were unable to isolate haemolytic streptococci of group A from any of the 355 wounds examined within 2 hours of infliction. But of 108 whose subsequent bacteriological history is known, no less than 4 acquired them some time during convalescence. In one case (W.I.L.) there was definite and clear evidence that the organisms were exogenous in origin seeing that they had been absent at two previous examinations of the wound 6 days apart, then there had developed an upper respiratory tract infection with haemolytic streptococci as the probable cause, and, following this, the appearance of the organisms in the wound accompanied by clinical infection. In the others, the source of the organisms was not so definitely established, but it is very striking that in two of the three the organisms were also present in the nasopharynx of the casualty himself.

On the whole, therefore, our efforts to trace the source of infection in the four cases in which haemolytic streptococci appeared in the wounds were not very successful. We have, however, studied other cases whose wounds were not examined directly after infliction although there was evidence that the presence of haemolytic streptococci at that time was extremely improbable. One of them, C.A.R., is a case in point.

C.A.R.—Second degree burn of the leg from burning gasoline on November 2nd. Debridement and wound tanned. Infection was not apparent until November 15th when there was fever and purulent discharge from the wound. No history of throat infection.

Swab from wound on November 16th, gave haemolytic streptococci, Type I. Survey of throats of contacts on November 18.—Emergency department: doctor and nurse both negative. Ward staff: surgeon, haemolytic streptococci Type II; intern, negative; six nurses—4 negative, 1 haemolytic streptococci Type 12, 1 haemolytic streptococci Type I. Throat and nose of patient were both negative. No other contacts.

Conclusion.—Probable infection from the nurse with Type I haemolytic streptococci in the throat who had assisted in the tanning of the wound.

In view of these results it would seem highly probable that in normal healthy persons who are not nose or throat carriers, the haemolytic streptococci which appear in wounds during convalescence are not introduced at the time of infliction but some time later and from some outside source. The two principal sources are the throat of one or other of his attendants and other infections, particularly wounds in the vicinity. On the other hand, when a naso-

pharyngeal carrier sustains a wound it may be infected at the time of infliction from organisms on his skin or his clothing which have been shown to be contaminated in a proportion of cases (Hare, 1941) or, if this does not occur, from organisms introduced into the wound from his own throat sometime later.

*Presence of staphylococci immediately after infection and during convalescence.*—The occurrence of staphylococci in the primary swabbings and the subsequent history of the patients is given in Table III. The table is given in two halves because the coagulase reactions were only determined after October 1st. Confining our attention to the latter period, it will be seen that 259 wounds were examined, in 188 of which staphylococci were found at the primary examination. The plates were always carefully searched and it was quite usual to encounter more than one type of colony. Samples of all varieties were preserved for further study. All strains were tested for ability to produce plasma coagulase.

It will be seen that of the 188 wounds from which staphylococci were isolated soon after infliction, no tests were carried out in 7, coagulase positive strains only were present in 27; both positive and negative strains in 7, and the remaining 147 patients had only coagulase negative strains. As many as possible of the patients were followed during the succeeding period and their clinical condition ascertained, although it was possible to obtain bacteriological material in only a proportion of them. This information is also summarized in Table III. Deducting the patients about whom we have no information, it will be seen that in patients with a coagulase positive strain at the time of infliction, only one subsequently suffered from a clinically obvious infection, due to staphylococci. This gives an attack rate of 5.2 per cent. Similar calculations for the remaining patients in which these organisms were absent, gives a figure of 4.2 per cent. Thus the group with coagulase positive strains in the wound at the time of infliction had an attack rate which was only slightly greater than that of the group which did not have these organisms. The numbers are too small to carry very much weight, but they hardly support the thesis that these organisms are introduced at the time of infliction in all instances of wound infection.

It will be observed that there were two cases of infection in which coagulase negative strains

only were present during the acute phase. One was a severe infection with a temperature of 102° and the wound filled with serosanguineous discharge. A pure culture of staphylococci only was obtained, although there was a mixture of golden and white colonies. Two colonies of the golden and one of the white were, however, coagulase negative, the test being repeated no less than six times. The other case had fever but only slight discharge from the wound, cultures from which yielded staphylococci in pure culture, also coagulase negative. There seemed to be little doubt that these infections were due to the staphylococci, although it is possible that other organisms which we failed to isolate were responsible for these infections. Otherwise it would appear possible that some infections may be due to coagulase negative strains.

The clinical condition of the patients was only considered in Table III, and the bacteriology of the wounds during the subsequent period, except for those infected, was not mentioned. This in-

in the serous discharges from it. But Gillespie, Devenish and Cowan (1939) found them on only 5.0 per cent and Smith (1941) on 19.5 per cent of normal skins. The fact that these strains were present in as many as 35.3 per cent of the wounds suggests that they were not derived from the skin.

We have made no attempt actually to trace possible sources in our cases, but the importance of the nasal carrier in this regard is debated below.

#### DISCUSSION

The investigations reported in this paper support the hypothesis put forward by Hare (1940 a, b; 1941) and Hare and Willits (1941) that the majority of haemolytic streptococcal infections of wounds are not due to the introduction of the organisms at the time of infliction but afterwards from some outside source, for group A haemolytic streptococci were not isolated from any of the 355 wounds examined within 2 hours

TABLE IV.  
PRIMARY AND SECONDARY BACTERIOLOGICAL EXAMINATION OF 71 PATIENTS INJURED AFTER OCTOBER 1

Primary examination	Number	Secondary examination				
		Staphylococci alone or with other organisms			No staphylococci but other organisms	No growth
		Coagulase				
+	+ and -	-	No test			
Staphylococci alone or with other organisms:						
Coagulase +.....	3	2	0	0	0	1
Coagulase + and - .....	4	2	1	1	0	0
Coagulase -.....	40	11	0	25	2	2
Not done.....	1	1	0	0	0	0
No staphylococci but other organisms.....	16	5	0	6	0	3
No growth.....	7	2	1	2	2	0
Totals.....	71	23	2	34	2	6

formation is given in Table IV, only cases occurring after October 1st being considered. Of the 259 wounds swabbed during the period under review, only 71 were examined again during convalescence. Only 7 or 9.8 per cent had coagulase positive strains in them at the time of infliction, but there were 25 or 35.3 per cent who had them during convalescence. Thus coagulase positive strains occurred about four times more often during convalescence than at the time of infliction. This again suggests that these organisms were not introduced at infliction but entered the wound some time later.

It might be suggested that these organisms had come from the skin near the wound by growth

of infliction but were isolated from 4 of 108 examined during convalescence.

These results appear at first sight to be directly contradictory to those of Pulaski *et al.* who also examined recently-inflicted wounds and found that no less than 12.5 per cent of them contained haemolytic streptococci. But they produced no evidence that these were pathogenic strains or gave any indication of the clinical outcome of the cases in which they were found. Even less is known about the strains isolated by Sas, Dimitza and Gutscher and by Sviridov who also found streptococci in a relatively high proportion of the wounds they examined. Other work, however, tends to confirm our point of

view. Orr Ewing, Scott and Gardner (1941) describe in detail the bacteriological examination of a small series of wounds treated in plaster by a method which allowed access for sampling. It is of some interest that in 5 cases examined within two to three hours of the accident, no group A haemolytic streptococci were isolated, whereas they were present in two of them when the wounds were examined again on the third and seventh days. In the series of wounds studied by Miles *et al.* (1940) there is no record of bacteriological examination of wounds directly after their infliction, but several instances are recorded in which haemolytic streptococci appeared in wounds known from previous examinations to have been free of them. And in the war of 1914-18, Fleming and Porteous (1919) noted that about 20 per cent of compound fractures of the femur were infected with haemolytic streptococci on arrival at the base, but over 90 per cent after they had been at the base for one week.

Thus all the available evidence would suggest that, contrary to what is frequently believed, haemolytic streptococcal infection of wounds is not invariably due to the introduction of these organisms at the time of infliction but that they find their way into the wound some time later from an outside source. The only exception is a wound in a casualty who is himself a carrier. Because the skin or clothing may be contaminated in such persons (Hare, 1941) there is a high degree of probability that the wounds will be infected at the time of infliction. Particularly will this be the case if the wound be in the face or other area accessible to the nasal secretion. But the normal carrier rate for group A strains is about 7 per cent (Hare, 1940) and only a proportion of the carriers have such contamination. The chances of infection in this way must therefore be very small.

If infection does not occur at the time of infliction we must consider possible sources. These are exogenous and comprise the nasopharynx of the casualty himself or that of the surgeon, dresser or other attendant, and the so-called hospital infection in which the organisms are transferred from other infected wounds, otorhinolaryngological conditions, impetigo, puerperal infections and similar haemolytic streptococcal infections in the same ward. It is impossible to say which of these is the most important; probably all play their part. Certainly we have found that a high proportion

of the infected cases dealt with in this paper and that of Willits and Hare (1941) had the organisms in their own nasopharynx, which renders it probable that this is a more important source than is usually supposed. On the other hand, Miles *et al.* have produced much evidence that cross infection in hospital may be of very considerable importance; and Willits and Hare (1941) discuss the methods by which this may occur.

Turning now to the staphylococci. It is generally assumed that when these organisms cause infection of accidental wounds or following clean operations they have been derived from the staphylococci present on the skin. While it is true that staphylococci are found on all skins, potentially pathogenic strains are not so common as is usually supposed. Employing the coagulase test as a measure of pathogenicity, Gillespie, Devenish and Cowan (1939) found positive strains on only 5 per cent and Smith (1941) on 19.5 per cent of normal skins. Thus, on the whole, these strains occur reasonably often for them to be looked upon as the cause of some wound sepsis. On the other hand, the evidence brought forward in this paper suggests that infection of accidental wounds by this organism is not invariably due to its implantation at the time of infliction, for while 9.8 per cent had positive strains at infliction, no less than 35.3 per cent had them later during convalescence. And if we consider the number of actual infections produced we find that this occurred almost as often in the group in which the potentially pathogenic coagulase positive strains were absent at the time of infliction as in the group in which they were present. There is also evidence that infection following clean operations may not be due to skin organisms, for Devenish and Miles (1939) have brought forward evidence that they may be derived from an outside source such as the nose of the operator or his skin, but not that of the patient. And lastly, the work of Hart (1937), showing that by irradiation of the air in operating rooms it is possible to reduce post-operative infection very considerably, suggests strongly that it is hardly the skin of the patient which is responsible for many of these infections. Much further work is obviously necessary before the matter can be considered as settled but the evidence so far available is certainly suggestive of an exogenous rather than an autogenous source for many of these infections.

It is not necessary to search very far for such exogenous sources, for it is now established that a high proportion of normal persons are nasal carriers of these organisms, Gillespie, Devenish and Cowan (1939) finding coagulase-positive strains in the nose of 43.4 per cent and Smith (1941) in 32 per cent of normals. They are much more unusual in the throat. Such carriers may cause infection during operations or while carrying out dressings unless they are efficiently masked. And in this connection there is now much evidence that the causative organisms in outbreaks of food poisoning due to staphylococcus enterotoxin can usually be traced to the nose of one or other of the food handlers (Wilson, 1940). It has also been shown by Devenish and Miles (1939) that infection at operation from the skin of the surgeon may be transferred through holes in the gloves. Thus there need be no difficulty in postulating methods for infection at the time of operation from other sources than the skin of the patient. But infection may take place after operation. This may occur by transfer of the organisms from the nose of the dresser, or the patient himself as well as by hands, instruments, or air-borne organisms from other infected cases as with the haemolytic streptococci. In a series of 14 post-operative infections investigated by us, it is highly probable that no less than 5 were actually infected after the operation because they first developed clinical signs indicative of an active infection so long after that event (8, 9, 13, 16 and 19 days) that it is extremely doubtful whether the organisms could have been implanted in the wound at the time of the operation. This suggests that they found their way in during the period of healing and that, contrary to what is usually supposed, all post-operative infection

is not due to a breakdown in the technique of the operating theatre. Whence the organisms were actually derived in these cases must be for future research, but 11 out of the 14 cases had the organisms in the nose themselves. This high carrier rate resembles in some measure our findings in the case of haemolytic streptococcal infections and suggests that the patient's own nose may be more important as a source of infection than is usually supposed.

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TREATMENT FOR POISON IVY.—Trial, under medical supervision, of a tannic acid treatment for poison ivy is urged by the United States Public Health Service on the basis of experiments by its scientists reported in detail in Public Health Reports (May 16th). Tests on a limited number of persons at the close of last year's poison ivy season were most encouraging. Itching and discomfort stopped within one or two days after beginning of the treatment and all symptoms disappeared at the end of a week. A 10 per cent solution of tannic acid in water is used. This solution is applied to the inflamed area after previous cleansing with alcohol. The treatment should not be attempted by laymen, it is stated, because,

among other reasons, it might do more harm than good if it were used on some skin inflammation that was not due to ivy poisoning. To prevent ivy poisoning scientists working at the National Institute of Health developed a vanishing cream containing 10 per cent sodium perborate. The cream is to be rubbed into the skin before going into woods or fields where there may be poison ivy plants. Directions are to wash off the cream with soap and water and put on fresh cream every four hours if you are going to be in the fields or woods all day. The vanishing cream should be made up fresh every two weeks. Both the protective vanishing cream and tannic acid treatment are effective against both poison ivy and poison sumac.—*Science News Letter*, May 24, 1941.

## A METHOD OF VACCINE THERAPY IN ATROPHIC ARTHRITIS\*

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MEDICAL literature abounds with references to the use of vaccines in the treatment of patients suffering with atrophic arthritis. It is not my purpose to review the extensive literature on the subject. The vaccines described are suspensions or filtrates or toxoids prepared from various micro-organisms. Different methods of administration have been described, such as oral, intraeutaneous, subcutaneous, intramuscular or intravenous. Some writers insist on a minute dose, others again use larger doses depending respectively on one of the supposed purposes—either to desensitize or to build immunity.

Vaccines have been prepared from organisms recovered from so-called foci of infection, from blood cultures, from joint tissues, from lymph nodes, and from the discharges from patients with atrophic arthritis. The custom holds to describe such vaccines as autogenous:

Some observers advocate the use of milk with its highly uncertain bacterial content as a form of shock foreign-protein therapy; also included in this method of therapy are stock vaccines prepared from staphylococci, streptococci, typhoid bacilli or adventitious organisms. Occasionally, following the administration of a foreign protein, a temporary remission of symptoms occurs. Many claims, possibly, some extravagant, have been made of the value of certain particular vaccines in the treatment of the disease; however the method has been subject to considerable criticism.

## INVESTIGATION

I have recovered an organism from regional lymph nodes of the affected joints of patients suffering from arthritis.<sup>1</sup> A number of patients have been treated with a vaccine prepared from this organism.

The micro-organism recovered is a diphtheroid. A patient with arthritis is prepared for operation and given a general anaesthetic. The regional lymph nodes (always enlarged) are dissected out. They are sectioned with a sepa-

rate scalpel that has been sterilized by heat alone. The bacteriologist attends the operation and has the sectioned nodes dropped into large tubes of plain agar slants overlain respectively with dextrose, lactose and plain broth and into special tissue media suitable for the growth of streptococci. These cultures are incubated for 16 days at 37.5° C., examined macroscopically, and if there is no evidence of bacterial growth they are incubated for a further 5 days and then examined microscopically. In cultures from lymph nodes removed from 131 patients a diphtheroid was recovered in 87 cases.

In primary cultures the organism is peculiarly pleomorphic; it frequently appears as a minute coccus resembling a minute streptococcus; the diphtheroid type develops on subculture. I have previously described the cultural characteristics of this organism and also the peculiar morphology as observed in a dark field preparation.

Control tubes of media were incubated for the same interval of time and also controls were made of the atmosphere and objects surrounding the field of operation; the results were negative, except on two occasions when a *Staph. albus* was obtained from cultures of surrounding objects of the operating field. In 20 cultures of normal tissue or of supposedly normal lymph nodes on two occasions a diphtheroid developed in the cultures, one of these was recovered from a breast tissue removed for a duct papilloma and one from muscle tissue from a patient who subsequently developed arthritis.

Cultures of lymph nodes removed from patients with psoriasis occasionally yielded a diphtheroid that did not reveal the same characteristics as those of the organism obtained from patients with atrophic arthritis. On two occasions a diphtheroid was recovered that gave the same reactions as the organism obtained from patients with arthritis; subsequent investigation disclosed that both these patients with psoriasis were also suffering from atrophic arthritis. In 8 cases a *Staph. albus* appeared which I believe represents a contaminant. In no instance was a streptococcus recovered. In our laboratory we are particularly interested in

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the history of this diphtheroid and we are investigating the parallel complex problem of dissociation.

The organism in primary cultures is arthrotrophic for rabbits and mice.

#### THERAPY

Vaccines prepared from these diphtheroids have been administered to patients suffering from atrophic arthritis. A record of the first 500 patients so treated is here presented. The diagnosis of atrophic arthritis had been made in 94 per cent of these previous to their being referred to us. Each patient presented the classical syndrome characteristic of the disease and each had more than one joint affected. Four hundred and forty-three showed fusiform enlargement of the phalangeal joints. All patients in this series gave a history of having had symptoms extending over at least five months. Seventy-five patients were bed-ridden, and these presented marked deformities. A number of the latter patients might be described as having reached a derelict stage following attempted repair by various methods, then side-tracked and forgotten whilst the modern therapeutic express rushed by to reach diseases more amenable to treatment.

The series included 324 females, 178 males. The average age was 35 years, the youngest two years, and the oldest 78 years.

The vaccines are prepared from several strains of the diphtheroid recovered from the lymph nodes. The vaccine is a saline suspension of the organisms heated to 60° C. for one hour and to which has been added 0.25 per cent tricresol. The patients received subcutaneous inoculations at weekly intervals over a period of three months. An initial dose of the vaccine contained 100 million organisms. The dose was gradually increased to a limit of 500 million. Treatment was discontinued after three months and was resumed following an interval of two or three months if symptoms returned or if improvement did not continue. Fifty of the patients took treatment at intervals over a period of three years or longer.

No serious ill effects as a result of the treatment were noted. The majority of the patients experienced some aggravation of symptoms in the affected joints 24 to 48 hours subsequent to the inoculation. This reaction is particularly associated with the first treatment and as a rule gradually subsides with each subsequent treat-

ment. Twelve patients who received control inoculations of normal saline failed to show this reaction and there was no arrest or improvement of the arthritis.

A more definite response occurred with the use of an autogenous vaccine in those patients from whom lymph nodes had been removed for culture than in those who received inoculations of the stock vaccine.

I have attempted without success to determine by the cataphoretic velocity the antigenic value of the strains of the diphtheroid as observed at different stages of its development. Skin sensitivity tests were indefinite and I found them of little value. Examination of the patients' blood serum indicated that a progressive increase in the specific agglutination and complement fixation antibodies specific for the diphtheroid occurs following the inoculations.

Eleven of the patients who were apparently not improving on receiving the vaccine were treated with serum from the blood of rabbits which had been immunized by repeated inoculations of the vaccine prepared from the diphtheroid. Each of these patients definitely improved.

I have administered the vaccine to 11 patients with gonorrhoeal arthritis; no benefit or change that might be attributed to the use of the vaccine was noted. Twenty patients with definite hypertrophic arthritis also received the vaccine only two of these experienced any relief.

#### FINDINGS

Of the 500 patients with atrophic arthritis who had received one or more courses of treatment with the vaccine 37 completely recovered during or immediately subsequent to the treatment; 377 showed a marked improvement and were able to carry on their normal occupations; in 48 slight amelioration of symptoms was noted and no progression of the disease occurred; and in 38 patients there was no alleviation of symptoms. The majority of the last group had suffered five years or more and were in an advanced or apparently completed stage of the disease.

Approximately one-third of the patients had additional treatment in the form of physical therapy. I could see little if any difference in the character of the symptoms and in the course of the disease between these patients and those who were receiving vaccine treatment only. However, orthopaedic measures for the correction

of deformities proved valuable in many of the advanced cases. Unless the disease was quite active and associated with elevation of temperature and a rapid sedimentation rate rest was not advised. On the contrary, we requested all ambulatory patients to carry on to the limit of their capacity. A surprising number of these patients were taking aspirin or narcotic compounds steadily. All drugs were discontinued. Purposely, no additional therapeutic measures were adopted other than to obtain the confidence of the patient and encourage an optimistic outlook, an important factor in any method of treatment of this disease, as Fletcher<sup>2</sup> and others point out. Ninety-three per cent of these patients had previously received various forms of treatment, and 15 per cent of these had received some form of vaccine therapy. Over 50 per cent gave a history of removal or treatment of some suspected foci of infection without subsequently experiencing relief.

#### DISCUSSION

The entire question of the value of vaccine therapy in atrophic arthritis is tossed about in the troubled waters of dispute.

The disease is characterized by indefinite remissions and, evidently, on occasions by complete, even spectacular, recovery, irrespective of, or in the absence of, therapeutic measures; hence an accurate appraisal of any method of treatment is difficult.

One notes a remarkable similarity in the various published statistics of the supposed beneficial results obtained following the use of some special therapeutic agent—a clear light to warn the unduly optimistic, a warning both to hesitate and to retain a critical attitude when attempting to evaluate by interpretation of the clinical results a method of treatment which is based on a single therapeutic agent. In this disease the word "improved" is susceptible of a wide variety of interpretation depending upon the experience and attitude of the observer.

Moreover a number of leading authorities on arthritis, particularly Hench<sup>3</sup> and also Pember-ton,<sup>4</sup> point out that practically the same favourable statistical results follow a careful, balanced and intelligent application of those general methods of treatment accepted as standard therapy for the disease.

The findings in this investigation are presented as a report rather than as an argument. I would, however, like to discuss for a moment

certain factors and criticisms associated with vaccine therapy.

The specific cause of atrophic arthritis has yet to be disclosed. At present the reasons that might be submitted for the application of vaccine therapy must perforce rest largely on an empirical basis. Then, too, the argument is frequently advanced, namely, that, founded on our present concepts of immunity, vaccines are essentially of value for prevention and not for cure, and that no analogy exists of the curative value of this agent in any other disease. The further argument is submitted that a disease of microbial origin postulates the presence of the organism or its toxins in the tissues and the further inoculation of the antigen therefore is of no value or, conceivably, may be harmful. These statements may bear a brief examination.

In diseases characterized by a slow incubation period, such as rabies or tetanus, vaccine therapy holds a distinctive place. True, the principle is prevention but the infective agent is already in the tissues. In recurring infections that might be classed as chronic, i.e., furunculosis, they have proved a valuable therapeutic aid. Moreover, I have frequently seen patients suffering from chronic sinusitis, chronic colitis, or from a chronic abscess who, following administration of a correctly prepared autogenous vaccine of the supposedly causative organisms have experienced relief when other methods of therapy have failed; independent of immunological concepts the clinical fact remains.

Also I suggest that a further interpretation of the process of immunity may be considered. The persistence of an immunity to certain infectious diseases, particularly those caused by micro-organisms characterized by the production of limited exotoxins, is not readily susceptible of the explanation that a single acute infection gave rise to a permanent humoral immunity. A further possibility or explanation requires investigation, namely, that dissociation of the causative micro-organism *in vivo* leaves a continuous residue in the form of the dissociated organism which while unable to excite the acute disease is however, able to excite the production of sufficient antibodies to the primary organism so that a further acute infection is impossible, but chronic infection is possible.

Such a residual organism either directly or through an allergic response could give rise to symptoms comparable to those seen in atrophic arthritis. True, the problem of allergy is com-

plicated and the term is not readily defined. However, as Gibson<sup>5</sup> points out, it is possible for the joint changes associated with atrophic arthritis to be present apparently without organisms in the joints.

Microscopic examination of a section of lymph nodes removed from patients with atrophic arthritis and from which nodes a positive culture had been obtained did not disclose the presence of micro-organisms. They are either invisible or too few in number to be noted. If the limited reservoir of the organism is in the lymph nodes, it is probable that the antigenic response would not necessarily be as marked as it would be if the organisms were inoculated in much greater numbers into other tissues. From this viewpoint of certain immunity reactions the administration of the vaccine prepared from the diphtheroids could be logical. While evidence is accumulating to suggest that residual organisms are an important factor in immunity final proof is lacking and the problem requires further study.

At the outset of this investigation our purpose, following the bacteriological study of the lymph nodes, was to develop if possible a method of serum therapy. I had little hope that vaccine therapy would benefit these patients. Criticisms of vaccine therapy based on our present knowledge of immunity appear logical. However, the evidence remains, irrespective of our inability to explain in exact terms the reasons for the result, that many of these patients improved while undergoing treatment with the vaccine, when, in the same patients the application of other and various therapeutic methods apparently had failed to give relief. Particularly it is to be noted that the disease appeared to be arrested in the majority of those patients treated during the early stage.

Forty years ago arthritis was a comparatively rare disease in Manitoba, possibly because we were at that time what might be described as a young country. The incidence is gradually rising and today with us as in older countries of the temperate climes arthritis is a major medical problem.

Finally, I should like to emphasize, as many observers who have a wide experience of the disease have done, that a more optimistic attitude towards the patient with atrophic arthritis is desirable.

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#### RÉSUMÉ

Un micro-organisme d'aspect diphtéroïde a été isolé des ganglions lymphatiques hypertrophiés juxta-articulaires de malades atteints d'arthrite atrophique chronique. Des vaccins ont été préparés avec ces diphtéroïdes et administrés aux malades souffrant d'arthrite atrophique. Les 500 premiers ont déjà un dossier complet. Soixante-quinze de ces malades étaient alités et présentaient des difformités marquées.

Les malades ont été traités par périodes de 3 mois, avec repos intercalaires de 2 à 3 mois. Le traitement était repris si des récidives survenaient ou si l'amélioration ne se maintenait pas. Les résultats ont été meilleurs avec les auto-vaccins qu'avec les stock-vaccins. Sur les 500 cas traités, 37 guérissent complètement, 337 s'améliorent au point de reprendre leurs occupations; 48 viennent seulement les progrès de la maladie s'arrêter et 38 ne furent aucunement soulagés. La physiothérapie ultérieure n'ajouta rien aux résultats obtenus.

Ce rapport ne prétend pas conclure que la vaccinothérapie de l'arthrite atrophique est le dernier mot, puisque cette maladie connaît des rémissions spontanées et que l'agent causal reste toujours méconnu, mais avant de traiter ces malades avec un sérum qui reste à mettre au point nos résultats nous encourageant à être plus optimistes qu'en ces dernières années. JEAN SAUCIER

**GERMAN BABIES' DEATH RATE.**—The death rate of German babies last year was still much higher than the infant mortality rate in England, comparing the figures for 126 English large towns with German towns having a population of over 100,000. The latter statistics, from the *Reich's Journal of Public Health*, which have now become available, give an infantile mortality rate during

1940 of 63 per 1,000 as against the English rate of 51. The German rate is the highest for the last four years, for each of which it has been at least 10 per 1,000 higher than the English rate. In no one year since the Nazis bluffed their way to power has the number of the "Herrenvolk's" surviving infants approached the English total.—Contributed by Industrial Publicity Unit, London, Eng.

ON THE CHARACTER AND CO-INCIDENCE OF RETINAL  
HÆMORRHAGES OCCURRING IN DIABETES\*

BY FRED. T. TOOKE AND JOHN V. V. NICHOLLS†

*Montreal*

ON June 24, 1937, a contribution was read by us before the Section of Ophthalmology of this Association on the findings noted in the fundi of 100 patients suffering from cardiovascular hypertension. An attempt was made to clarify the subject clinically, bio-chemically, and ophthalmoscopically, by describing with as much detail as was possible the type of haemorrhage present in these cases, and to analyze them as a possible type of haemorrhage in the given class of disease. We later extended our observations in a paper read before the same Section two years later on the effects of these haemorrhages and the underlying element of hypertension brought about by splenectomy.

We are now attempting a relative retrospect similar in all the essentials in 100 cases of diabetes mellitus which had been subjected to a careful ophthalmoscopic study.

In approaching what we must define as an attempted review rather than as a problem we do not wish to be misinterpreted or even to be misunderstood by presuming that, in the first place, every case of diabetes as it has been studied and treated at the Royal Victoria Hospital, has been subjected to an ophthalmoscopic examination. Such has not been the case in this institution, or in any other in which we are able to trace records. Neither are our statistics tabulated from handpicked or specially selected case reports. As in the case of cardiovascular hypertension, we had to go through and carefully review somewhat over 400 reports before we were able to collect 100 in which an ophthalmoscopic opinion had been requisitioned. That more were not studied must not be laid at the door of the Department of Ophthalmology. The cardiovascular and the diabetic type of patients have been examined under precisely the same conditions and with similar care and attention.

We might further add that our investigations were carried out upon, and our conclusions

drawn on, only those who were admitted as public patients in the Department of Metabolism, and not from private patients or from other diabetes as they appeared in other services of the hospital. It was thought that such a class of patients as we had under consideration through such a procedure had all the advantages of investigation at their disposal without financial or other encumbrance or embarrassment.

Joslin makes the statement that from 1900 to 1938 diabetes as a cause of death has come from twenty-seventh to ninth place. From the age of 55 years onward, in New York City, diabetes ranks fifth as a cause of death. One does not dare challenge such figures, supported as they are by the statistics of the Metropolitan Life Insurance Company. Strange though it may seem, after an analysis of cases of diabetes admitted to the wards of our hospital in the past ten years, contrasted with all other types of medical admissions, diabetes has increased only 0.02 per cent. Of course, as we have already acknowledged, the Department of Metabolism has only been able to accommodate through these years patients up to its ultimate capacity. And again, patients may frequently find themselves in other departments of the institution. Further, with a better knowledge of the treatment of the disease and of its control, countless numbers of patients have been supervised by their family physicians at their own domiciles without the necessity of having to resort to hospital accommodation.

Of the 100 cases examined ophthalmoscopically, and of which precise records were kept, hemorrhages occurred in 23 cases. The incidence in this particular series is of significance. The youngest patient was 15 years of age; only 12 patients were under the fifth decade, so that our figure conveys that incidence in itself is a factor to be taken into consideration. Arteriosclerosis as an indication of senility can be seen in people otherwise free from arterial disease and with no trace of diabetic disorders. It is a matter of controversy, consequently, if arteriosclerosis *per se* could be

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held as responsible for the type of haemorrhage recorded, or if a source had to be investigated through some other field.

Humphrey Neame asserts that the most severe cases of diabetes occurring in young people are generally free from retinitis. He is of the opinion that there is no distinct retinitis belonging to diabetes. This is undoubtedly the fact in those cases in which the features of renal or arteriosclerotic retinitis predominate. Mr. Neame emphasizes the exudates which are clear-cut in outline, solid and wax-like in appearance, and arranged in a circinate manner around the macula. There are no cotton-wool patches, and rarely is a star-figure present at the macula. The haemorrhages are small and rounded as this authority claims on account of their occurring in the deep layers of the retina. This fact, however, would not be sufficient explanation, as haemorrhages in a true hyperten-

sive retinitis are equally deeply placed. Their size is much more probably due to the fact of an arteriole being involved rather than a larger vessel. According to Mr. Neame, diabetic retinitis is extremely rare under the age of 35 years.

Diabetic retinitis is not caused by diacetie acid, or by acetone, or hyperglycæmia, as these are found more commonly in the severe cases of youth in which retinitis does not occur. It is not due to lower calcium content of the blood as was formerly supposed. Diabetic patients who are free from retinitis frequently have intraocular haemorrhages which may occur in the retina in massive form or as a subhyaloid extravasation, or into the vitreous as a smoky cloud or a dense opaque curtain.

To return to the age-incidence. One case occurred in the second decade, 5 in the third, 6 in the fourth, 14 in the fifth, 36 in the sixth, 31 in the seventh, and 7 in the eighth. These figures correspond closely with the statistics of Joslin from 1898 to 1933 and from 1936 to 1938.

Of the 100 cases investigated, 24 patients were male and 76 female, the increase in the preponderance of the female sex being more manifest with the increasing ages. This bears out the opinion of Joslin, who states that sex plays no rôle until the age of 25 years, but thereafter it is a factor of increasing importance. At the age of 65 years and over, one in every 45 women has diabetes, while only one in 70 men is so afflicted. This may be due to an increased obesity in the female sex rather than in the male.

To return to the question of cardiovascular hypertension. It is worthy of note that in only one instance were there symptoms of a cerebral accident, while in cardiovascular hypertension 21 cases out of 100 were so reported.

Of the cases manifesting haemorrhages, 19 belonged to the female sex, of an average age of 56.4 years. There were 4 males manifesting retinal haemorrhages, of an average age of 66.8 years. Of the hemorrhagic cases the average blood sugar before eating was 197, while the average blood sugar after eating was 245, a definite rise.

To analyze our cases of haemorrhages as they were related to the question of high blood pressure. Nineteen cases showed haemorrhages associated with cardiovascular hypertension; of these, 15 were petechial in character, while only 4 were large or flame-shaped. Of these 19 cases

TABLE I.

Diabetic cases 100 cases: 76 females, 24 males				Primary hypertensive cases 100 cases: 52 females, 48 males		
	Low	High	Average	Low	High	Average
Age—years....	15	79	55.9	39	84	58.7
Blood pressure.	90	250	159.1	160	260+	195.5
	44	160	85.7	80	120	110.6
Creatinine.....	For nor- mal.	most normal.	part	1.01 mg. per cent	2.14 mg. per cent	1.25 mg. per cent
Non-protein nitrogen.....	12.9 mg. per cent	76.8 mg. per cent	27.4 mg. per cent	17.1 mg. per cent	75.3 mg. per cent	30.4 mg. per cent
Urine, specific gravity.....	1.005	1.042	1.021	1.004	1.036	1.017
Urine, albumin.	0	+++	27 per cent showed albu- min	0	++	50 per cent showed albu- min
Casts.....	..	..	6 per cent showed hyaline casts	..	..	20 per cent showed casts
Blood sugar before meals.	67	522	207	..	..	..
Blood sugar after meals..	66	600	202	..	..	..

Certain of these cases were taken in relation to insulin, which would account for some of the low figures.

12 were associated with lymph exudates to a lesser or greater degree.

A point of manifest importance and of no little interest is that 31 cases showed a definitely high blood pressure and yet demonstrated no haemorrhages, thus raising the question, is the factor of arteriosclerosis of itself an element to be reckoned with? Another feature of a directly alternative character and equally positive in its suggestion is that in 9 cases with a normal blood pressure, haemorrhages were seen, causing one to suspect, if not absolutely conclude, that some element other than cardiovascular hypertension itself must be held responsible for the terminal changes. Normal blood pressure with no haemorrhages was observable in 40 cases. Of the cases described as large, occurring with an elevated cardiovascular hypertension, one was expulsive or malignant in character, accounting for a retinal detachment. Two cases showed exudates only without haemorrhages. To be more precise regarding the manifestation of actual retinal arteriosclerosis: 20 cases showed retinal arteriosclerosis with haemorrhages; 4 cases, no retinal arteriosclerosis and haemorrhages; 20 cases, retinal arteriosclerosis and no haemorrhages; 56 cases, no retinal arteriosclerosis and no haemorrhages.

Concerning the question of non-protein nitrogen plus, 9 were positive, with 2 manifesting lymph exudates. Those showing normal non-protein nitrogen with haemorrhages were seen in 15 cases, 2 with lymph exudates, while a raised non-protein nitrogen without haemorrhages was recorded in 15 cases. A normal non-protein nitrogen without haemorrhages was noted in 54 cases. Non-protein nitrogen has little to do with the question.

Prothrombin time was noted in about twenty cases, and only 2 showed clotting time, indicating a low prothrombin level. Of these, the fundus was normal in one, and in the other there were a number of small petechial haemorrhages with contracted arteries and buckled veins. A cerebral accident occurred in 1 case only, as contrasted with 21 cases in our series on hypertension.

Eleven per cent of our cases demonstrated gall-bladder disease. Of these, only one showed a retinal haemorrhage. Diabetes, as a rule, comes on after the gall-bladder trouble, and the haemorrhages have not had time to develop due to the lack of time in the establishment of a retinal arteriosclerosis. In this

series 4 had high blood pressure and 1 had haemorrhages. Pre-existing gall-bladder disease with diabetes apparently does not excite retinal haemorrhages.

Gangrene was present in 8 cases. It is impossible exactly to determine to what this gangrenous condition is referable. Focal infections may have some bearing; arteriosclerosis, as supposed to be responsible in the whole pathogenic process, may be looked to; or terminal thrombi as noted in the capillaries supplying impoverished, or toxic tissues may be held as the underlying factor. Supporting the theory of arteriolar sclerosis, it is interesting to note that five of the eight cases in which gangrene was present manifested retinal haemorrhages.

Regarding the urine specific gravity in diabetic cases; all but five were examined. The high represented 1.042, and the low 1.005, with an average of 1.021. Of the 98 cases examined for albumin 71 gave negative findings. Those showing positive findings ranged from zero to three plus. Ninety-eight cases were examined for casts, and only 6 per cent showed a few of the hyaline variety. The blood sugar before eating registered a low of 67, and a high of 522, with an average of 207; the blood sugar after eating registered a low of 66, a high of 600, and an average of 202. Twenty-one of the 158 cases so examined must be given special consideration in that they were being treated with insulin at the time.

It is a reasonable enquiry, with the unlimited series of cases at our disposal, why we did not investigate more hundreds of cases in which a similar type of analysis had been undertaken. The answer to such a question is obvious, for two particular reasons; the first is that such a complete investigation as was necessitated in a study of even the present series required a great deal of time; more could not be afforded for the period at our disposal after our co-operation in contributing to this program was solicited. The second reason is, and probably more important, that a level had to be drawn between the hypertensive and diabetic cases so that a comparison could be arrived at by reviewing two series of precisely the same number.

An analysis of our series of diabetic cases with those of cardiovascular hypertension is interesting and instructive. The question of age, when one considers the average, is not so

vitably different; but the extremely young were to be found in the diabetic class of case, while the relatively older were seen in the primary hypertensive group. Blood pressure was distinctly higher in the primary hypertension class of case, an average of 195.5/110.6, as contrasted with 159.1/85.7.

The question of creatinine may be put aside as irrelevant. Non-protein nitrogen is fairly comparable in the two types of cases. In the primary hypertensive cases the low was 17.1 mg. per cent, the high 75.3 mg. per cent, and an average of 30.4 mg. per cent, while in our diabetic series the low was 12.9 mg. per cent, the high 76.8 mg. per cent, and the average 27.4 mg. per cent.

Reviewing the urine specific gravity. In the hypertensive group it registered low 1.004, high 1.036, with an average of 1.017. In the diabetic cases it was, low 1.005, high 1.042, and an average of 1.021. Albumin was present in 50 per cent of the cases of primary hypertension, but in diabetes 71 of the 98 cases examined showed negative findings. In cardiovascular hypertension 20 per cent of the cases showed the presence of hyaline casts, while only 6 per cent in the diabetic series showed casts. These two latter comparisons point to a more pathological inclusion of a kidney in the production of disease.

#### DISCUSSION

Max Kries makes the observation that changes in the retina are inflammatory to a very slight extent. The ophthalmoscope shows changes in the vessels and haemorrhages, and whitish patches, according to Hirschberg, are always found in cases of diabetes which have lasted ten or twelve years. Hirschberg considered these as terminal manifestations of the disease. Some of these are the result of co-incident albuminuria, the result of epithelial necrosis, fatty degeneration, and interstitial changes in the kidneys, and differ in no respect from retinitis albuminuria. Hirschberg distinguishes two principal forms: (1) A variety with light small shining patches, usually with petechial haemorrhages. The patches are always found in both eyes; the impairment of vision develops gradually and the optic nerves are not affected. Implication of the optic nerve, opacity of the adjacent retina, and dilatation of the vessels distinguish the albuminuric from the diabetic type, although occa-

sionally these types may be reversed. (2) A haemorrhagic form either in the shape of small petechial haemorrhages, larger haemorrhages associated occasionally with vitreous opacities, haemorrhagic infarctions, venous thrombosis, or even haemorrhagic glaucoma. The disturbance of sight depends upon the size and location of the haemorrhage.

On the whole, haemorrhages are the most frequent among diabetic diseases of the retina, although in our comparative series we have found them more frequently demonstrable in the primary hypertensive cases. As in albuminuria, haemorrhages in diabetes afford a bad prognosis, worse than those who present merely degenerative foci and exudation. Haemorrhages in the retina may be a forerunner of cranial haemorrhages, although in our series of 100 cases we had only one instance of a cerebral accident, in comparison with 21 cases in a similar number of primary essential cardiovascular hypertension. To quote two of the earlier writers: Lagrange in a series of fifteen examinations in diabetic subjects found haemorrhages in thirteen; Galejowski, in the examination of 144 diabetics, recognized haemorrhages in 27 cases. Kries emphasizes the importance of urinalysis in every case of cataract or retinitis for which a definite cause cannot be assigned. Hirschberg found diabetes in 1 per cent of all his private patients. This author, however, was concerned very largely with the examination of the affluent Jewish community, which may have or have not had some bearing on the cases. It may be added that it is our practice in the public wards of the Royal Victoria Hospital, to make a blood sugar examination on all the cataract cases which are admitted for observation and subsequent operation.

To revert to a more modern expression of opinion, that of Sir W. Stewart Duke-Elder, whose third volume on Diseases of the Eye has recently appeared. It is a question in his opinion, after a review of the subject, whether a true diabetic retinopathy actually exists. The problem has excited a great deal of controversy and the end is not yet. Duke-Elder, in his review of the earlier authorities, cites Hirschberg's conclusions, which we have already described. Since the publication of his classical papers, ophthalmological opinion has been divided into two schools, the first of which believes that the fundus changes are specific, while others are

as emphatic that such is not the case. Among those who support the first school are LaGrange, Hirselberg, Nettleship, Foster Moore, Friedenwald, Dabney, Gifford, Folk and Soskin, and others, amongst whom we would include ourselves.

1. The supporters of such an opinion feel that a clinical picture is present which, while not pathognomonic for diabetes, has certain features distinguishing it from arteriosclerotic or from renal retinopathies.

2. Although a high blood pressure, arteriosclerosis, and possibly albumin may be present and associated with the condition, some cases occur in which these are minimal or absent. A large series of authorities are quoted who have made such observations. Duke-Elder says that some of the more recent and carefully controlled figures are quite high; thus Gray found that 49 out of 66 cases of definite retinopathy were consistently without albumin, a statement which our investigation can readily support. Folk and Soskin found that in 15 closely studied cases with central retinal punctatepathy 9 showed no cardiovascular complications and had a relatively low blood pressure, which is also recorded in our tabulated series.

3. The frequent unilaterality, its occurrence in old people, its relative good vital prognosis and its occasional response to treatment, differentiates it from renal, and, we might add, as well as from the retinopathy noted in primary essential cardiovascular hypertension.

Those who support the other side of the question express the following views:

1. The clinical picture is frequently not typical, and transition forms occur, showing all gradations between what is generally accepted as characteristic of arteriosclerotic retinopathy on the one hand and renal on the other. We are ready to accept such an assertion and have cited at least one instance of an extreme degree of cardiovascular hypertension in which a condition of diabetes was a co-existing incident.

2. There is no demonstrable relation between the severity of the diabetes and the extent of the retinal changes, for they are not seen in those subjects in whom the diabetes is most accentuated. Changes are only noted in older patients, usually with a relatively mild degree of the disease, but frequently complicated by arteriosclerosis, if not by renal changes. It might be noted here, however, that the age in-

cident occurred when arteriosclerosis, in any event, was to be anticipated, and also that the existence of albumin in the urine was only an occasional finding.

3. To quote further from Duke-Elder, whose citation we have very closely followed: it is argued that the clinical absence of albumin may be transitory or may be associated with advanced pathological changes in the kidney, and that the apparent absence of arteriosclerosis may be histologically refuted (Cohen). All these facts have led others to assume that the condition is not a disease entity but a type of arteriosclerotic retinopathy, modified perhaps by the diabetic diathesis; Hassen and Knaack, Garrod, Wagener and Wilder, Friedenwald, Carreton and Camino, Gresser, Dirion, Bessiere, on the other hand, hold that its significance is that it is a premonitory sign of commencing renal failure. Duke-Elder analyzes these opinions as holding much truth on either side. He agrees that diabetic retinopathy occurs most frequently in the subjects of vascular sclerosis or hypertension, and, even when not clinically apparent, some vascular damage is probably usually present. Further, a large number of diabetic patients are the subjects of renal deficiency.

Conversely, many arteriosclerotics and hypertensives are potentially diabetics, a tendency induced by a vascular sclerosis of the pancreas. But the fact that these changes may be minimal, or even in the minority altogether absent, makes it necessary for some of us at least to assume that some factor of a toxic nature, presumably metabolic in origin, enters into the question and determines the more frequent and ready occurrence of retinopathy in diabetics with arteriosclerosis than in uncomplicated arteriosclerotics, just as gangrene of the limbs occurs more frequently in the former than in the latter. Moreover, it would seem obvious that such a factor could modify the clinical aspect of the case and give it an individuality of its own. Duke-Elder further states that as we have seen that an infective toxic factor alone can produce a very similar clinical picture (exudative retinitis) so there is no impossibility in the suggestion that a metabolic toxic factor should not act similarly on the minute arterioles of the retina. It is worthy of note that a derangement of the lipid balance of the blood can produce in the retina lesions

similar to diabetic retinopathy, if that tissue is already diseased (Sugita, Jess). It is easy to comprehend that if this factor is but little in evidence, and if the factor of arterial or renal disease is much in evidence the clinical appearance in the eye will not conform to type, but will tend to assume the characteristics of one or other of these, and there is no reason why a pure hypertensive or arteriosclerotic or renal retinopathy should not occur in a diabetic, a question we have already raised.

Duke-Elder goes on further to note that even although the condition is usually associated with arteriosclerosis, the fact that a parallel can be drawn with renal retinopathy, which requires the combination of the circulatory disturbance and a toxic factor for its development, makes it difficult to treat the one as a clinical entity and the other not. For if diabetic retinopathy is to be called arteriosclerotic retinopathy occurring in diabetes, so also should the other be referred to as arteriosclerotic or hypertensive retinopathy occurring in nephritis.

Duke-Elder concludes his treatment of the subject by saying that haemorrhages are an extremely common event, occurring either alone or in the presence of exudates. Two distinct types occur. Usually they commence by being small and peripheral and they gradually increase in number approaching the macular area so that the entire fundus is peppered with them. They are sometimes superficial and flame-shaped, but more usually they are deep and round, and are quite frequently situated away from the larger vessels, which may show absolutely no sign of sclerosis. Our experience rather favours their being associated at or near the terminal of the retinal arterioles, in this way favouring a thrombosis of a tiny blood vessel rather than the effect of a raised blood pressure on this small vessel. When sclerosis is present in addition, however, and more especially when a septic focus exists elsewhere in the body, extensive haemorrhages may occur. These probably result from an infective perivasculitis. Masses of extravasation appear in the retina, pre-retinal haemorrhages occur and recur, or the whole vitreous may be flooded with blood, a catastrophe which is not infrequently followed by retinitis proliferans and permanent loss of vision. It is especially noteworthy that these massive haemorrhages usually

occur in diabetics whose condition is fully controlled, and that they are particularly associated with sepsis and invariably with sclerosis.

Regarding lymph extravasations. These exudative spots, which are characteristic of diabetic retinopathy, usually occur in the central area. The specific features which differentiate them from other retinopathies are that they are solid, soapy, or waxy, with well-defined and sharply outlined edges, and that they are distributed irregularly in the central area, frequently forming a rough circle around the macula. A macular star is rare except when renal complications are present, and when it does occur it is usually partially formed and asymmetrical. These lymph patches are usually circumscribed but may attain considerable dimensions by accretion; like the haemorrhages, they are inert and persist, remaining long without visible change. A retinal oedema is rare, and when it does occur it appears in a slight degree and seems to be incidental to the process, probably representing a change comparable to the oedema of the epithelium of the iris. We have seldom, if ever, noted pathological changes in the optic nerve head, unless complications involving a cardio-renal hypertension have become manifest.

The principal features which differentiate the condition clinically from a renal retinopathy are the solid, soapy, clear-cut patches, in contradistinction to the soft woolly masses, their irregular central arrangement without a macular star, their association with deep and round rather than flame-shaped haemorrhages, the absence of oedema at the disc or in the retina so that a retinal detachment seldom occurs, and the inertness of the whole picture. Duke-Elder emphasizes the most important single feature as being the absence of oedema. As we have frequently pointed out and emphasized, relatively few cases are absolutely typical, and when sclerotic, hypertensive, or renal complications are added, any modification or gradation may be encountered, from arteriosclerotic retinopathy on the one hand to renal on the other.

Various investigators reveal little peculiar to the condition. Sclerotic and endarteritic changes are common. They may be extreme; according to others, such as Humelshcim and Leber, and Cohen, who say that sometimes these changes cannot be detected clinically.

Hæmorrhages are typically small and in the outer layers, according to Beauvieux and Pesme, and the exudates are aluminous rather than fibrinous, and are usually deeply placed in the plexiform layer where cystic spaces abound, as noted by Foster Moore, and Koyanagi.

The prognosis of diabetic retinopathy with regard to life, while worse than that of a simple arteriosclerotic condition, is much more favorable than in renal disease. Many cases have been followed for from eight to ten years. In the presence of arteriosclerosis or hypertension the outlook is by no means good, either as regards vision or expectancy of life. A

great deal depends on the absence of sepsis elsewhere and, of equal importance, on the co-operation afforded by the patient in the constant and unremitting treatment of a disease which is always monotonous and occasionally difficult. As a general rule the prognosis with regard to vision is bad, for despite treatment changes tend to be progressive, and frequently the macular area may be ultimately included in the trail of circumstances.

In conclusion we would like to express our thanks to Dr. E. H. Mason, for his kindness in affording us access to all the reports in the Department of Metabolism; and also to Dr. Leo S. Kirschberg for his assistance in the compilation of our statistics.

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## THE PRESENT STATUS OF CYCLOPROPANE\*

BY RALPH M. TOVELL,† M.D. AND CURTISS B. HICKCOX,‡ M.D.

*Hartford, Connecticut*

CYCLOPROPANE occupies a place in one of the newest and most interesting chapters in anesthesiology. As it is a relatively new agent we should pause from time to time to properly evaluate the agent and determine the direction in which progress is being made. Schmidt has said that science and anesthesia are necessary for the development of each other while the art of anesthesia plays a secondary rôle. The need for anesthesia was recognized long before agents were discovered. The use of drugs had to await the discovery of scientific facts relating to physiology and pharmacology before anesthetic agents could be used.

In 1882 von Frend described the chemical agent, cyclopropane, as trimethylene but at this time no mention was made of its anesthetic properties. Other German chemists experimented with the production of this substance, but it remained for Lucas and Henderson of the University of Toronto, to discover in 1928 that the gas, which they considered as an impurity in propylene, was actually an anesthetic agent. In their experiments propylene proved better than ethylene, but the former product obtained from some tanks was toxic to animals.

One of them suggested that an isomer, cyclopropane, occasionally appeared as an impurity in the production of propylene. To their surprise, this impurity when administered alone, proved to be a more powerful and less toxic anesthetic agent. Rabbits and cats were used as experimental animals and they showed little metabolic change when anesthetized with this agent. The gas at that time was difficult to manufacture and to isolate in pure form and could not be obtained in large quantities.

Waters and his workers, using a closed system with carbon dioxide absorption, were able to carry out clinical experimentation on several hundred patients by 1933. They reported their experiences in 1934. Griffith had opportunity to use it in 1933 and he found it safe, controllable, and dependable.

**Chemistry.**—Cyclopropane is the simplest possible cyclic hydrocarbon with the formula  $C_3H_6$ . It is a colourless gas, mildly pungent but not unpleasant to smell or taste. In anesthetic concentrations it is odorless. It is heavier than air, is inflammable, and explosive. The explosive range is from 2.4 to 10.4 per cent, approximately in air, and from 2.4 to 63.0 per cent, approximately, in oxygen. It is marketed in cylinders under a pressure of 75 lbs. per square inch, at which pressure it exists as a liquid. One ounce is equivalent to approximately 4.29 gallons of gas.

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*Chemistry.*—Cyclopropane is the simplest possible cyclic hydrocarbon with the formula  $C_3H_6$ . It is a colourless gas, mildly pungent but not unpleasant to smell or taste. In anesthetic concentrations it is odourless. It is heavier than air, is inflammable, and explosive. The explosive range is from 2.4 to 10.4 per cent, approximately in air, and from 2.4 to 63.0 per cent, approximately, in oxygen. It is marketed in cylinders under a pressure of 75 lbs. per square inch, at which pressure it exists as a liquid. One ounce is equivalent to approximately 4.29 gallons of gas.

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*Pharmacology and physiology.*—Cyclopropane is slightly soluble in water, and readily soluble in oil, the oil-water ratio being 34.4:1. The gas is soluble in the blood with the cells absorbing about two and a half times as much as does the plasma. Absorption through pulmonary alveoli is rapid and unconsciousness supervenes in from one to two minutes. Cyclopropane undergoes no chemical change within the body, equilibrium is reached slowly, and complete desaturation takes place over a period of hours. Recovery of consciousness occurs rapidly when anaesthesia is discontinued.

The respiratory tract is not irritated by anaesthetic concentrations of the gas, though laryngospasm occurs occasionally in the presence of high concentrations. There is some increase in the production of secretions of the oral and respiratory tracts during anaesthesia unless preliminary medication is employed. The respiratory rate is not increased during anaesthesia but may be reduced as a result of the high oxygen content of the inspired atmosphere. As anaesthesia deepens respirations decrease in rate and amplitude and respiratory movements cease before circulatory failure occurs. Respiration may be reestablished by decreasing the concentration of cyclopropane in the circuit. Artificial respiration by means of intermittent manual pressure on the breathing bag may be necessary.

The effects of cyclopropane upon the circulatory system are principally those associated with sensitization of the automatic tissue of the heart. If epinephrine or related drugs are administered there is a further increase in irritability of this tissue. Arrhythmias occur and include ventricular extra-systoles, A-V nodal rhythm, fast ventricular rhythms or tachycardia and occasionally ventricular fibrillation. These arrhythmias are said by Robbins to occur most frequently when anoxia is present and when morphine has been used as a pre-medicant. Burstein and Marangoni have found experimental evidence that procaine hydrochloride when it was injected intravenously in dogs combats ventricular fibrillation induced by the administration of epinephrine during cyclopropane anaesthesia. Arrhythmias do not occur frequently when average anaesthetic concentrations of cyclopropane are employed and when they occur they may be abolished by either increasing the pulmonary ventilation or

by decreasing the concentration of cyclopropane. Guedel advocates using high concentrations of cyclopropane in order to avoid the occurrence of cardiac irregularities. The pulse rate during anaesthesia may be decreased, if morphine has been used as a premedicant, or increased, if a barbiturate has been used. With a combination of the two the pulse may approach the normal rate.

The gastro-intestinal tract shows an increased tone during anaesthesia with a decrease in the propulsive action of the gut. The amplitude of the non-propulsive contractions is not altered. The gravid uterus in experimental animals continues to contract rhythmically and fetal respiration is said to remain unchanged. Smith found that the maternal arterial and venous bloods were of about equal oxygen saturation but that fetal blood oxygenation was low. It was observed that with deliveries under cyclopropane anaesthesia there were more apnoeic infants and that the concentration of the anaesthetic agent was almost as high in the fetal as in the maternal blood. With nitrous oxide only half as much of this agent is found in the fetal blood as in the maternal blood. He states that: "for obstetrical anaesthesia, cyclopropane would appear to be perhaps less safe for the infant than the clinical appearance of the mother would indicate". This viewpoint does not coincide with our clinical experience.

Values for hydrogen ion concentration of the blood during anaesthesia are normal and the carbon dioxide combining power may be normal or slightly decreased. The oxygen content and capacity are increased, the total bases of the serum are not changed and the value for non-protein nitrogen is normal. The level of the blood sugar in normal patients rises slightly, but in diabetic patients during cyclopropane anaesthesia it may not change. Bourne and Raginsky have shown that cyclopropane does not cause hepatic damage in patients with normal or impaired livers, nor is there renal damage. There is a suppression of urinary output during anaesthesia and a compensatory increase in excretion for several hours following anaesthesia. Leucocytosis is marked for a few hours after anaesthesia and the white cell count does not return to normal for two to three days. There is very little change in the red blood count.

*Preliminary medication.*—The science of anaesthesia now includes pre-anaesthetic medication as an indispensable part of the anaesthetic program,

which starts with the pre-operative preparation and continues through the operative and post-operative periods. There are several aims to be achieved by means of medication prior to anaesthesia. It is desirable to allay fear and emotional disturbances associated with the operation, and to lower metabolism to the basal rate in order that the desired operative conditions may be produced by minimal doses of the anaesthetic agent. Because cyclopropane is depressing to the respiratory system, respiration should not be depressed during the pre-operative period. The incidence of cardiac irregularities during anaesthesia may be minimized if proper preliminary medication is employed.

Waters warned against the larger doses of drugs commonly used preceding ether, nitrous oxide, or ethylene anaesthesia. These doses were too depressing when cyclopropane was used and apnoea occurred early in anaesthesia. Bourne, however, has stated that: "in general anaesthesia if more sedative drugs are used, so much more readily will narcosis be induced and maintained". Waters has noted little if any change in the consumption of oxygen, a decrease in the minute respiratory volume with morphine alone, a slight increase in minute respiratory volume with scopolamine alone, and distinctly less reduction in minute respiratory volume with the combination of morphine and scopolamine. Waters after a detailed study of the effects of morphine, scopolamine, and atropine concludes that: "Regarding respiration there is a balancing effect of morphine and scopolamine and that there is an actual additive effect in the direction of satisfactory anaesthesia. Some amnesia is obtained which is lacking when atropine is substituted for the scopolamine. The undesirable effects of morphine are less frequent and less marked when the dose is combined with scopolamine and likewise the undesirable effects of scopolamine alone are seldom seen after combined medication. These drugs tend to balance each other in their effect upon pulmonary ventilation". The drugs are given in the ratio of morphine sulphate 25 to scopolamine hydrobromide 1. Individualization of dosage is necessary and divided doses an hour apart are used when there is any doubt about the total dose. With this method the effects of either drug can be observed and, if one drug predominates, then the dose of this drug can be decreased in the next administration. The desirable interval between the administrations of preliminary medi-

ation and induction of anaesthesia is approximately 1.5 hours. Observation of untoward action to the drugs before anaesthesia is possible.

Many anaesthetists advocate the administration of a derivative of barbituric acid in combination with morphine and atropine, or morphine and scopolamine. A relatively short-acting barbiturate such as pentobarbital sodium (sodium ethyl [methylbutyl] barbiturate) or seconal (sodium propyl-methyl-allyl barbiturate) may be given orally or rectally from  $1\frac{1}{2}$  to 2 hours before operation, followed by a combination of morphine and atropine administered subcutaneously 1 hour before operation. Patients on arrival in the operating room are usually drowsy and have little interest in their surroundings. If they are alert or apprehensive seconal, gr. 1.5 or 3.0, may be given. For patients with elevated basal metabolic rates, with fever, or for athletic robust individuals the dose of the barbiturate and morphine may be increased slightly. Robbins has found that in experimental animals cardiac irregularities occur most frequently during cyclopropane anaesthesia when morphine has been used as a pre-medicant. When a barbiturate alone has been used prior to anaesthesia there have been no cardiac irregularities until after the occurrence of respiratory arrest produced by high concentrations of cyclopropane. The dose of morphine, therefore, should rarely exceed gr. 1/6 (0.01 g.).

We prefer the administration of atropine to scopolamine because this agent satisfactorily depresses secretions in the respiratory tract and because we prefer administration of a barbiturate rather than scopolamine for the production of sedation. The dose of atropine may be varied from gr. 1/150 to gr. 1/100 (0.4 to 0.65 mg.). At times it may be necessary to repeat the dose of atropine in order to obtain the desired pharmacological effect. Leake has stated that in clinical doses neither atropine nor scopolamine produces peripheral paralysis of the vagal fibres to the heart, but that both may stimulate the vagal centre and thus decrease the pulse rate. According to Adriani, atropine offers an advantage in that the involuntary muscles of the bronchi and bronchioles are relaxed. This results in a slight widening of the airway and a slight increase in the volume of residual air. Reflexes initiated by intratracheal intubation, inflation of a tracheal cuff, or insertion of a bronchoscope under cyclopropane anaesthesia cause distur-

bances in cardiac activity. These may produce narrowing of the coronary vessels with a resulting decrease in blood supply to the myocardium or they may induce profound alteration in the reaction of the specific tissue of the heart. Reid states that atropine has a specific effect in abolishing or minimizing vagal effects and would seem to possess great advantage in decreasing, if not actually preventing, many undesirable features, potentially present in vago-vagal reflexes. This is evidence of the value of atropine as a premedicant and gives further justification for its widespread use combined with morphine under these circumstances.

Novatropine, a newer drug, has been recommended by Martin and Batterman in place of atropine for preliminary medication. It has the advantages of ordinary atropine and, in addition, it reduces markedly the tone and motility of the gastro-intestinal tract, during cyclopropane anaesthesia. The doses that are suggested vary between 2.5 and 7.5 mg. With the larger doses motility of the gastro-intestinal tract could be entirely eliminated. The drug is given subcutaneously in combination with the morphine from 60 to 90 minutes before operation.

Guedel has recommended the intravenous administration of a relatively large dose (0.6 to 1.0 gram) of a barbiturate (evipal soluble) prior to induction of cyclopropane anaesthesia. The threshold of response to stimuli may be elevated and apnoea occurs as cyclopropane is administered. Passive respiration is maintained. With this method he claims a marked reduction in the incidence of cardiac irregularities, which occur if administration of the barbiturate is omitted. We frequently administer pentothal sodium intravenously while the patient is in his room. He is transferred to the operating room while under the effect of a dose sufficient for induction of anaesthesia. Wood has recommended the use of tribromethanol in amyrene hydrate (avertin fluid) for the production of basal narcosis. He uses it in combination with morphine and atropine while Griffith and Bourne prefer to omit the morphine. With this method too, the patient is asleep before arrival in the operating room. Waters recommends avertin for terror-striken children. The amount of cyclopropane necessary to maintain surgical anaesthesia is small

and cardiac irregularities during anaesthesia are uncommon. Wood has also used a newer basal anaesthetic drug, triehlorethanol, which has given results similar to avertin.

*Signs of anaesthesia.*—The signs of anaesthesia with cyclopropane are not as well defined as with other agents because of the rapid action of the gas. Using a closed system with carbon dioxide absorption, induction is rapid and unconsciousness results in two to three minutes. Eversole, Sise, and Woodbridge have said that if induction is slow the established signs of depth of anaesthesia as outlined by Guedel can be observed, but in Romberger's opinion there is no need to differentiate between the first and second stages or to separate stage three into planes. He recommends a simple method of judging depth by dividing the administration into three levels: first, induction, from the awakened state to the loss of lid reflex; second, moderate anaesthesia, that level of surgical anaesthesia during which the eyeball oscillates; and third, deep anaesthesia, in which the eye is centrally fixed and there is reduction of respiratory activity. With the onset of respiratory paralysis both the depth and rate of respiration are reduced. With this method, however, the sign of the oscillating eyeball is of little value once that stage has been passed, for with lightening of anaesthesia the patient may strain or vomit before ocular motion is again observed. During moderate and deep anaesthesia the pulse rate and character of respiration are reliable guides. There is little evidence of respiratory stimulation since the gas is not irritating to the respiratory tract. One must guard against depressing respiration to a degree where anoxia may be present. As one approaches deep anaesthesia the pupil begins to dilate and the cornea lacks lustre and is dry. The pulse is of normal rate and volume during moderate anaesthesia. A marked increase or a decrease to a rate of 50 per minute indicate untoward reaction and, in our opinion, the concentration of cyclopropane should be lessened. Anaesthesia may be produced with cyclopropane in a concentration of from 6 to 8 per cent in the inhaled mixture, second plane anaesthesia requires approximately 13 per cent, and third plane approximately 23 per cent. Respiratory failure may occur with a concentration as low as 35 per cent.

*Administration.*—Cyclopropane is best given by the closed circuit method because the gas is expensive and is explosive when mixed with oxygen. The gas has been given by inflation by Waters with satisfaction but much is wasted and the danger of explosion is greater than when the gas is contained within a closed system. The same disadvantages are present when the semi-open method is used as in nitrous oxide or ethylene anaesthesia. With a closed system, there are two principal methods of administration, the intermittent and the continuous flow of gases. Waters described a method in which oxygen was administered at a rapid flow of eight to ten litres per minute as the mask was placed upon the face; this flow was continued until the rebreathing bag and canister were full. Cyclopropane was allowed to flow at a rate of 600 to 700 c.c. per minute for two to three minutes. The flow of oxygen was maintained at from 250 to 400 c.c. per minute and cyclopropane was added intermittently for the production of surgical anaesthesia. Most anaesthetists have followed this method in principle but varying rates of flow of the gases are employed. Hathaway offers a modification by adding air during anaesthesia in an effort to avoid excessive oxygenation. With this technique one must watch closely for evidence of lack of oxygen developing with respiratory depression. He states that the flow of cyclopropane is not started until the patient, machine, and operating table are contacted by the anaesthetist and until the face mask is adjusted to the patient's face. This is a conscious effort to minimize the dangers of static sparks in an area where explosive gases may be escaping into the room. Romberger advises adding ether vapour in order to avoid excessively high concentrations of cyclopropane, but Griffith and Leach prefer to depend upon the administration of cyclopropane without the addition of ether.

We have used Waters' method of administration with a few variations. The rebreathing bag is filled with a 50-50 mixture of oxygen and nitrous oxide. The mask is placed upon the patient's face and a flow of 300 c.c. of oxygen per minute is started. Cyclopropane is added at a rate of 500 c.c. per minute for approximately two minutes. The pulse, blood pressure, and rate of respiration are checked. Cyclopropane is then added at a flow of 500 c.c. per minute for fifteen to thirty-second intervals. The signs of anaesthesia are checked after each

addition until surgical anaesthesia is reached. Absorption of carbon dioxide is started before the patient has reached the first plane of the third stage of anaesthesia. We do not exceed a flow of cyclopropane of 500 c.c. per minute, and if cardiac irregularities occur the concentration of the gas is decreased and oxygen is added to the mixture. Ether vapour is frequently added if relaxation is not adequate or if cardiac irregularities persist. If leakage occurs, nitrous oxide with enough oxygen to reduce the concentration of nitrous oxide below 90 per cent is added to refill the system. We regard a pulse rate of 65 or less or a rapid pulse rate of 120 or over during anaesthesia as untoward signs; the concentration of cyclopropane is decreased and anaesthesia is lightened. If the pulse rate does not approach a level of between 65 and 100 and adequate relaxation is not present, ether vapour is added to the mixture of gases. At the termination of the administration flushing with oxygen is not practised, the mask is lifted from the patient's face, and recovery ensues.

Guedel has advocated a unique method in which a barbiturate is given intravenously to produce apnoea, after which intratracheal intubation is done and cyclopropane is administered intermittently in large amounts. Respiration is carried on passively. He states that circulation may be considered an intermediate stage of respiration with the function of adequately oxygenating tissues and removing carbon dioxide. Cardiac arrhythmias are reflex in origin and are subject to the same influences as any other reflexes during anaesthesia. One disadvantage of this method is that emergence delirium occurs and the incidence of it is greater than with other agents and other methods. It may be controlled by addition of ether vapour during the latter part of the anaesthesia. Respiration, colour of the skin, and abdominal relaxation are the three cardinal signs of anaesthesia. This method is employed principally for surgical procedures where relaxation equal to that obtained with spinal anaesthesia is being sought. McCuskey cites emergence delirium as the chief drawback to Guedel's method and he combines various forms of regional anaesthesia such as subarachnoid, peridural, or abdominal block, with light cyclopropane anaesthesia in an effort to obtain

adequate relaxation without the occurrence of cardiac irregularities or emergence delirium.

Burford has advocated that a slow continuous flow of cyclopropane be maintained during surgical anaesthesia. He claims that with this method anaesthesia is smoother and relaxation is adequate. The method provides against dilution of the cyclopropane which otherwise occurs, due to the tendency of tissues to absorb the gas and due to loss of gas through the skin and wound and through the rubber bag and tubing. He also advocates dilution of the concentration of oxygen with a relatively non-absorbable gas such as helium or nitrogen in an effort to avert the occurrence of atelectasis.

Jones, Kennedy, and Thomas have suggested the use of inert gases to reduce the content of oxygen in anaesthetic mixtures and thus render them non-explosive. They experimented with carbon dioxide, nitrogen and helium and found the latter to be best suited as a quenching agent. Haas, Hibshman, and Romberger have reported upon the use of cyclopropane, oxygen and air in non-inflammable mixtures for clinical anaesthesia. Horton has found that four component mixtures containing cyclopropane, ethylene and oxygen with either nitrogen, helium or hydrogen added can be used in non-explosive ranges. With a four component mixture the concentration of oxygen may be sufficiently high to permit avoidance of anoxia in clinical anaesthesia. Use of these mixtures involves the solution of many practical problems. Until some form of apparatus indicating the presence of non-explosive mixtures has been devised, we must consider clinical application of this principle to be in an experimental phase.

*Uses and application.*—It has been said by Robbins that there are practically no contraindications to the use of cyclopropane except where cautery, x-ray, or electrical apparatus are to be employed and where the use of sympathomimetic drugs is contemplated. The use of the cautery, open flame, diathermy or x-ray equipment during the administration of cyclopropane cannot be too strongly condemned. Greene has shown in his statistical studies of reports of fires and explosions that 70 per cent of the explosions were due to causes for which effective safeguards had long been known. These reports included many explosions of agents other than cyclopropane.

Cyclopropane has been almost universally applicable in the hands of Griffith and he has used it for patients varying in age from seven days to ninety years. He used this agent in obstetrical practice not long after its introduction to clinical use and he has reported on it as being the most favourable agent for Caesarean section. Eversole has termed cyclopropane the most satisfactory agent when general anaesthesia is required. He recommends it especially for surgical procedures within the thorax when the patient's vital capacity may be markedly decreased. Rovenstine states that cyclopropane is in favour for thoracic surgery but that it has not been adopted as a routine anaesthetic for intrathoracic procedures, nor has it excluded nitrous oxide, ethylene, or ether. He emphasizes the advantages of intratracheal intubation and controlled respiration by manual compression of the rebreathing bag.

Hathaway warns against the use of cyclopropane for small infants, not because the agent is particularly harmful, but because existing equipment for absorption of carbon dioxide provides too much dead space and offers too much friction. He also states that cyclopropane anaesthesia is used more frequently at the Wisconsin General Hospital for patients classed as poor risks than are other agents. Sise and Woodbridge have cited cyclopropane as a favourable agent for anaesthesia in the seriously ill patient. Its value rests upon the fact that a large volume of oxygen can be given, thus avoiding anoxæmia and providing adequate oxygenation of the myocardium. In patients with congenitally malformed hearts, cyanosis and dyspnoea are abolished during anaesthesia. Light anaesthesia abolishes reflexes and patients awake quickly, with few after effects, and little depression. For thyro-cardiac patients this agent is recommended. With an endotracheal tube in place, respiration is free and unobstructed. When compression is present, tracheal collapse is avoided and venous pressure is not increased. Cyclopropane anaesthesia is advised for patients in shock when operation cannot be delayed.

Knight has been one of the few to advocate the use of cyclopropane for obstetrical analgesia. He has described apparatus for administration of the gas by the patient. Relief of pain was satisfactory and the patients were awake, though drowsy, between contractions.

They co-operated well, labour progressed rapidly, and the babies cried spontaneously upon delivery. In the obstetric department at Hartford Hospital the longer-acting barbiturates are employed to relieve pain and produce amnesia early in labour. Scopolamine is used as an adjuvant. During the last hour of the first stage and up until the time of delivery, nitrous oxide and oxygen are administered in concentrations sufficient to produce analgesia. For delivery, cyclopropane and oxygen provide adequate anaesthesia, safe for mother and infant. During the past ten years our total fetal loss has been reduced from 4.1 to 2.7 per cent. In the same period maternal mortality has been reduced from 0.30 to 0.084 per cent.

Cyclopropane and oxygen may be used with other inhalation agents and it may be used in combination with other methods of anaesthesia. Griffith has been able to obtain adequate relaxation for all types of operation without the addition of ether vapour to the cyclopropane-oxygen mixtures. It is a suitable anaesthetic agent for many surgical procedures involving structures outside the abdomen. For surgical procedures involving structures within the abdomen relaxation may not be adequate unless anaesthesia is carried into the third plane of the third stage. In the hands of many it is safer to add small amounts of ether vapour in the closed system in order to obtain the desired degree of relaxation. For upper abdominal procedures an abdominal block with a solution of procaine hydrochloride in 1 per cent concentration, carried out after induction of cyclopropane anaesthesia, will provide relaxation of abdominal muscles without the necessity for employment of deep general anaesthesia. The procaine may provide some protection against the occurrence of cardiac irregularities. With an endotracheal tube in place the anaesthetist has a method which is safe and controllable.

Whitaere and his associates obtain relaxation and avoid the untoward effects of deep general anaesthesia by administering an anaesthetic agent intraspinally in conservative dosage and immediately afterward inducing light cyclopropane anaesthesia. A much lighter level is maintained than would be possible without spinal anaesthesia. The margin of safety is said to be increased by this method and the unpleasant psychic factors of spinal anaesthesia as well as nausea and vomiting during operation are prevented.

*Complications.*—Complications during and following cyclopropane anaesthesia are minimal, and their incidence is not increased over that observed with other inhalation agents. During anaesthesia, cardiac irregularities may occur but post-operatively circulatory complications are infrequent. Major pulmonary complications occurring post-operatively are seen less frequently than following the use of ether. Nausea and vomiting also occur less frequently than following ether anaesthesia. Abdominal distension occurs post-operatively in a small percentage of cases, but ileus is rarely seen. Headache and excitement occur as frequently with cyclopropane as with ether or ethylene.

#### SUMMARY

We fully agree with the statement made in 1939 by the Council on Pharmacy and Chemistry of the American Medical Association that "cyclopropane is a suitable anaesthetic agent when used cautiously by those fully informed of its properties, potential dangers and signs which indicate the stages of anaesthesia obtained with this agent". All the safeguards recommended by the National Fire Protection Association should be maintained throughout the administration of this agent.

*Note:* A very full bibliography has been prepared.

**APPENDICITIS DEATH-RATE Low.**—The death-rate from appendicitis has reached a record low point, after a long and steady rise culminating nearly a decade ago, according to statisticians of the Metropolitan Life Insurance Company. "In 1940," the report states, "the adjusted death-rate from this cause was 8.9 per 100,000 (ages 1 to 74 years), the lowest in the experience of the company, and represented a decline of nearly 40 per cent

from the high rate, 14.4 per 100,000 recorded in 1929. Moreover there is every indication the death-rate in 1941 will again set a new low record." Advances in surgical skill, and, even more far-reaching, increased public understanding of the symptoms of the disease, of the need for prompt medical and surgical attention, and of the danger of laxatives in case of abdominal pain, are credited with reducing the appendicitis death-toll.—*The Diplomat*, November, 1941.

## CAT-BITE WOUND INFECTION

BY A. E. ALLIN, B.A., M.D., D.P.H.

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TO the long list of human diseases acquired from animals it appears we must add still another, which, though less serious than many of those hitherto recognized, is still no less a clinical entity. For lack of a better term this condition has been called "cat-bite wound infection". In each instance the patient gives a history of being bitten by a cat; shortly afterwards swelling and pain develop at the site of the bite, and subsequently there is usually abscess formation either locally or in the regional lymph glands. Convalescence may last for weeks or even months. The same micro-organism, a member of the genus *Pasteurella*, has been isolated from the cases where bacteriological investigations have been made.

This condition was first described in Germany by Rimpau<sup>1</sup> in 1937. He reported three instances where persons had been bitten by apparently healthy cats and had subsequently developed more or less severe infections. His first case was a man aged 42. Two hours after the man had been bitten swelling developed at the site of the bite and he suffered from fever and chills. Subsequently an abscess developed in the axilla and healing lasted six weeks. In a second instance, local wound and abscess formation of the arm followed a cat-bite. From both these cases a minute Gram-negative bacillus was isolated, which was described as belonging to the haemoglobinophilic group. Bacteriological studies were made on this micro-organism by Kremsreiter.<sup>2</sup> He exhumed the body of the cat which had bitten one of the patients and which had subsequently been killed. From its trachea and bronchi he isolated an organism identical with that recovered from the wound of the patient. It differed in no manner from bacteria isolated from the respiratory tracts of both healthy and diseased cats of the area. Rimpau included a third case but no bacteriological studies were made. He did not believe such infections were very serious but referred to southern slaves calling abscesses "little cats" and wondered whether this might be of significance.

In 1938 Schenk<sup>3</sup> wrote his doctorate thesis on the subject of *Pasteurella* in the air-passages of

cats and in wound infection from cat-bites in man. He referred to 4 instances where purulent infections followed cat-bites, including in this small series one of Rimpau's cases. The findings were the same in each instance and similar to the observations made by Rimpau, *viz.*, that "within a few hours following the bite severe pains set in at the site of the wound and in the forearm, and that in spite of speedy medical attention—on one occasion even after excision of the bite wound about an hour after the bite occurred—a developing abscess which healed only slowly and with many complications could not be prevented". Schenk carried out extensive bacteriological investigations on the organism recovered from each of his cases. He also carried out studies on the flora of the respiratory tract of 14 healthy and 6 sick cats, isolating a similar organism from 9 healthy and the 6 sick animals. He believed the bacterium was identical with that isolated by Kremsreiter, although the latter had described his organism as being "haemoglobinophilic".

Schenk described the micro-organisms recovered from the cat-bite wounds and from the respiratory tract of the above cats as being a minute Gram-negative bacillus which showed bi-polar staining when isolated from pus or from the blood of an injected rabbit. This characteristic was not evident on agar culture but pleomorphic forms occurred with degeneration. Colonies were medium-sized, colourless early, later becoming greyish-white. They were vaulted, the edges were smooth, and they were non-haemolytic. Early they were mucoid and possessed a fluorescence. Growth was scanty on plain agar. No change occurred in litmus milk, but indol was produced, and acid without gas was formed in dextrose, galactose, levulose, sucrose, xylose, mannite and maltose. The strains isolated from wounds produced no acid from lactose but certain strains isolated from cats produced acid from that sugar. The organism was pathogenic for certain laboratory animals. A rabbit was injected subcutaneously with pus from one of the wounds. It died in less than 24 hours. The autopsy showed the typical picture of septicæmia. The organisms were

readily demonstrated in the heart blood and grown in pure culture. A mouse injected subcutaneously with this pus also died and the organism was subsequently recovered from its blood.

During the past year the Provincial Laboratory, Fort William, has received swabs from two lesions which followed cat-bites. The same organism was isolated in both instances and appeared to be identical with the organism described above by Schenk as the cause of "cat-bite wound infection".

#### CASE 1

Mrs. D., aged 36, was admitted to McKellar Hospital, Fort William, on April 11, 1939. Two weeks prior to admission she had been bitten on the wrist by a cat the upper fangs entering the skin on the dorsal surface of the lower end of the radius, and the lower fangs penetrating the volar surface near the radial artery. A few days later, pain, redness and swelling developed in the latter area. This increased in severity until admission to hospital. A diagnosis of abscess was made. The area was incised and there was slight drainage. Her temperature remained normal. The wound healed without sequelae following her discharge from hospital on April 13th. No bacteriological investigation was carried out at that time.

Eleven months later an aching pain and swelling developed over the dorsal surface of the lower end of the radius where the upper fangs had penetrated the skin, and on March 20, 1940, she was readmitted to McKellar Hospital, a patient of Drs. C. E. Spence and Jas. Markham. The following day the area was incised, drained, and the local necr of bone curetted. The operation report read as follows: "A subperiosteal abscess and edema of soft tissues was encountered on incision of the skin and a large osteomyelitic cavity of the lower end of radius with a small opening filled with chronic granulation tissue was found. The bone was opened through this small opening and curetted. Thick yellow pus, old granulations, and necrotic bone were encountered. The cavity was 'bipped' and packed with iodoform gauze". Following operation she experienced great relief. The patient's temperature, normal on admission, rose to 99° following operation but had returned to normal by March 27th, when she was discharged from hospital. The wound healed and the patient has remained well subsequently.

**Laboratory investigations**—Curettings were submitted to Dr. S. G. Penny, Provincial Pathologist, for examination. His report reads as follows: "Gross specimen: Consists of several irregular curettings composed of dense bony tissue with some softer cancellous bone in some portions. Microscopic report: Sections of the bone tissue after decalcification show numbers of bone spicules with fibrous marrow tissue which is infiltrated densely by neutrophiles, lymphocytes and plasma cells. The general picture is that of a chronic osteomyelitis in cancellous bone. Diagnosis: chronic osteomyelitis."

A swab taken from the cavity in the radius was examined in the Provincial Laboratory, Fort William. A direct smear of the pus showed moderate numbers of pus cells, chiefly neutrophiles. Many of these cells contained numerous minute Gram negative coccus bacilli and an occasional rod form. Culture on a blood agar plate produced a moderate growth of an organism resembling in morphology those seen in the smear. A suggestion of bi polar staining was noted. It was non motile. It grew best at 37° C., producing on blood or chocolate agar a luxuriant growth of flat, smooth edged colonies with a shiny surface. These were greyish white in colour, had a tendency to be mucoid, and had a characteristically disagreeable odour. At 20° growth was more scanty. Growth in beef infusion broth was uni-

formly turbid; in glucose broth there was a heavy granular deposit. Growth was rather scanty on plain agar, was inhibited on McConkey's, and there was no growth on eosin methylene blue or tellurite media. No change was produced in litmus milk. It was indol positive, hydrogen sulphide was not formed. Acid but no gas was formed in mannite, sorbitol, dextrose, sucrose, xylose and maltose, no acid was produced in insulin, gluconic, raffinose, lactose, inositol, rhamnose or arabinose.

Shortly after the organism was isolated 1 cc. of an over night broth culture was injected intraperitoneally into a white mouse and a guinea pig. Both died in less than 24 hours. Evidence of a generalized peritonitis was present and it was readily recovered in pure culture from the heart's blood of both animals. Several months later a rabbit was injected intravenously. No symptoms of disease developed, nor could the organism be recovered a few days later. Nine months after the organism was isolated, and after frequent subculture on blood agar slants, it was no longer pathogenic for a guinea pig but was still lethal for white mice. A kitten was not injected.

#### CASE 2

Mrs. J. M. was seen by Dr. C. E. Spence on March 11, 1941, seven hours after she had been bitten on the hand by a large, stray cat, which was apparently healthy. The hand was swollen and painful. The fang marks were quite evident. Local treatment was applied and the patient returned home. Pain and swelling subsided and the patient has remained well.

Swabs were taken from the fang wounds. Smears showed a little fibrin. On culture we were able to grow a few colonies of an organism similar to that described above, as well as a scanty growth of a yeast and of a diphteroid rod. The first mentioned organism was carefully studied and the morphological and cultural characteristics and biochemical reactions shown to be identical with the organism isolated from Mrs. D. A rabbit was injected intraperitoneally and guinea pigs and white mice both subcutaneously and intraperitoneally. All died within 24 hours, with death apparently due to septicemia. The organism was readily recovered from the peritoneal washings and from the heart blood in pure culture. In smears made from the heart blood of the rabbit the bipolar staining was prominent. A fibrinous exudate was present over the liver and spleen of the guinea pigs. The peritoneal cavity in every instance contained a little blood stained fluid. The filtrate from a broth culture was tested for lethal, dermo necrotic, and lytic effects. None were found present.

Two weeks later we were able to obtain the body of the cat which had inflicted the wound. It weighed more than eleven pounds. Swabs were taken from the mouth, trachea, and bronchi, and from the mouth an organism was isolated which proved to be identical with the strain isolated from the wound on the hand of the patient.

Unfortunately no blood was obtained from the cat which had inflicted the wound, or from either Mrs. D. or Mrs. J. M. for agglutination tests against the three strains isolated.

#### CASE 3

No bacteriological studies were made in this case, but it is included because the clinical picture so closely resembles the condition in which we are interested.

In September, 1925, Mr. Y., aged 63, was bitten on the finger by a cat. Shortly afterwards he became acutely ill and was admitted to St. Joseph's Hospital, Port Arthur, a patient of Dr. P. M. Ballantyne. He apparently developed a septicemia and his axillary glands became large and painful. About a week later he was discharged from hospital although these glands remained large and very hard, and the skin was puckered locally. On December 9th the glands again became swollen and painful and on December 20th he was admitted to McKellar Hospital, a patient of Dr. L. Y. McIntosh. The glands were incised and the area drained

His pulse remained normal and he was discharged from hospital January 22nd. His subsequent history has been uneventful.

### DISCUSSION

We agree with Schenk who believes the microorganism is a *Pasteurella* related to *Cuniculicida*, and would relate it to organisms described from the respiratory tracts of cats by Kairies.<sup>4</sup> In 1922 Rivers and Bayne-Jones<sup>5</sup> isolated seven strains of influenza-like organisms from 15 cats, describing them as resembling the para-influenza bacilli frequently recovered from man. The biochemical reactions of these strains so differ from the micro-organisms previously described by Rimpau, Kremsreiter and Schenk, and now by ourselves, that it is improbable that Rivers and Bayne-Jones were dealing with the organism causing "cat-bite wound infection". The type species of *Pasteurella* is *avicida* and was first isolated from fowl-cholera. Subsequently numerous strains have been isolated from an equal number of species of animals. We agree with Topley and Wilson<sup>6</sup> who state "such data as are available do not suggest that the strains from the various animal species which are liable to natural pasteurellosis are themselves specifically distinct". We therefore cannot see our way clear to identify it as one of the species of *Pasteurella* as at present named.

From a study of the above cases it is evident that the bacteriologist in future must be on the watch for *Pasteurella* in his examination of wound material, particularly where such wounds have been infected by bites from cats and possibly other animals. The clinician must be aware that cat-bite wounds may not respond readily to the usual treatment, but may heal slowly and with sequelæ, chiefly abscess forma-

tion. Study of future cases may reveal whether the newer drugs will be efficacious in the treatment of such infections.

### SUMMARY

1. Cat-bite wound infection is a definite clinical entity due to an organism belonging to the genus *Pasteurella*.
2. Inflammation results at the site of the wound shortly after the patient has been bitten by a cat. Abscess formation, local or regional, usually results and convalescence as a rule is prolonged.
3. The causative organism is harboured in the mouth and respiratory tract of both healthy and sick cats.

4. Six cases in the literature have been reviewed and 3 additional cases added. In one of the latter the organism was also isolated from the mouth of the cat which had inflicted the wound.

5. Reference has been made to the bacteriological and clinical significance of this new infection.

The author wishes to thank Professor E. G. D. Murray, Department of Bacteriology and Immunity, McGill University, for making this paper possible by drawing our attention to the above references.

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**NEW LOW DEATH RATE.**—According to the statisticians of the Metropolitan Life Insurance Company the 1941 January-June mortality experience of the company's industrial policyholders set a new low death rate record of 8 per thousand for the first six months of 1941. From present indications it seems likely that the rate for the full year will be among the lowest in the company's history. Among the respiratory diseases, pneumonia mortality for the first six months of this year declined 13.2 per cent below the rate for the corresponding period of 1940, while the tuberculosis rate of 44.8 per hundred thousand is the lowest of any January-June

period. One of the most "satisfactory" features of the 1941 half year record is the continued decline in maternal mortality, for which the death rate this year was slightly lower than in 1940 and only a little more than half that of 1935. And this was in spite of the fact that the marriage rate is up and the number of births has increased materially. The statisticians declare that the "only really disturbing element in the mortality record for the first half of 1941 is the high incidence of fatal accidents, particularly motor vehicle accidents, mortality from which was 26.1 per cent higher than in the corresponding period of 1940".—From the *J. Am. M. Ass.*, 1941, 117: 542.

## ACRODYNIA\*

By U. J. GAREAU

*Regina*

In June, 1934, at the Annual Meeting of the Canadian Medical Association at Calgary, the author reported a series of 26 cases of aerodynia,<sup>1</sup> and concluded that, firstly, this disease is probably the result of a toxæmia dependent on infected tonsils and adenoids and that the duration of illness was shortened by removal of such, and, secondly, because of its chronicity more cases should be diagnosed in their incipiency. In June, 1940, before the Southern Saskatchewan Clinical Meeting, an additional 49 cases were reported, making a total of 75 cases, an average of over eight per year. Thirteen of these had been seen in the last six months of 1939 and the first six months of 1940, and, strangely, but one case in the twelve months since. This eyelid tendency has been commented on by several authors and is referred to by Roenaz<sup>2</sup> as "epidemic outbreaks". As this is mostly a statistical report, the story of the discovery of this disease has not been included. Those interested are referred to an excellent article by Herz.<sup>3</sup>

## HISTORY OF CASES

Seventeen cases came from the cities, 17 from smaller centres, and 41 from farms of Saskatchewan. Thirty were males and 45 females. The seasonal incidence was highest from December to June. The average duration of illness when first seen was a little less than two and one-half months. The average age at onset was a little over 11 months, the youngest having been 5, and the oldest 42 months. The average birth weight was seven and one-quarter pounds. Forty-five had been fed at the breast for an average period of five and one-half months. Their feeding histories revealed that 12 had been poorly fed, 27 fairly well, and 30 adequately fed, 6 cases having been uncertain. Family histories were largely negative, 4 families having been tuberculous. Of special interest was a family history of aerodynia in four families, one family having had three children with the

disease, and three families having had two cases each. Two of these families each lost one child from complications. The majority of parents dated the onset of illness to some antecedent illness such as influenza, head cold, sore throat, bronchitis, earache; four blamed whooping-cough, and three, dysentery. The complaints on first examination, in order of frequency and importance were, fretfulness, irritability and unhappiness—35 cases; loss of ability to sit, stand and walk—29 cases; sore eyes—26 cases; loss of weight and sleeplessness—8; rash, spoken of as eczema and itch—5; profuse sweating, loss of teeth, fever, attacks in diminishing frequency.

## SYMPTOMATOLOGY

Sixty-two cases were treated in hospital for an average period of over four weeks, so that opportunity was provided for study of their symptoms and progress. The 75 cases all presented muscular hypotonicity in varying degrees. The opinion is that a diagnosis of aerodynia should not be made without the presence of hypotonicity and some cases, especially in their incipiency, presented no other constant symptom. Often aerodynia was suspected when the parents came in complaining that their child, who once could sit, stand and walk, could no longer do so. Sometimes the hypotonicity was very severe. Seventy-one cases displayed irritability, fretfulness and sleeplessness, and the majority adopted unusual sleeping postures. Sixty-seven had general lymphatic glandular enlargement. Rashes were present in 64 cases, being miliarial, papular and macular, or a combination of these. A few, when first seen with a fine rash, had been diagnosed scarlet fever by their local physicians. Rashes came and went and appeared to be dependent on excessive sweating, which was present in 52 cases. This hyperhidrosis occasioned intense thirst, and one twelve months' child was seen to thirstily gulp down a pint of water in a few seconds. Shades of pinkness to deep blueness coloured the face and extremities in 65 cases, the latter presenting a non-pitting edema of hands and feet which later desquamated from

\* Read at the Seventy-second Annual Meeting of the Canadian Medical Association, Section of Pediatrics, Winnipeg, June 25, 1941.

time to time. Most of these children, when fretful and restless, appeared to enjoy a gentle massage of their hands and feet which have been said by various authors to tingle, burn and pain. At their first examination, 62 children were an average of three and one-half pounds underweight, 8 being normal and 5 overweight. The gastro-intestinal system showed loss of appetite in 36 cases, a few having been normal; constipation in 44, diarrhoea in 19, and vomiting in twelve. Diarrhoea appeared in those stubbornly constipated for no apparent reason. The month showed evidence of stomatitis in 32 cases. Naso-pharyngitis was present in 47 and febrile attacks in 41 instances. Photophobia appeared in 40 children, varying in severity and duration, and tending to disappear and recur from time to time. This sign should always occasion the suspicion of acrodynia in an infant. Twenty-nine displayed loss of hair; 4 had each lost from three to five teeth, and some of one child's fingernails had become gangrenous and dropped off. The sleeping pulse rate averaged 137 in 24 cases, and the blood pressure 122, systolic, in 15 cases. Twenty-eight had an average haemoglobin of 70 per cent and 32 an average white blood count of 13,470, with an average of 40 per cent of polymorphonuclears. Four had positive intradermal tuberculin tests, and there were no positive Wassermann reactions. The genito-urinary system showed evidence of complications in 23 cases, these having been pyelitis and pyelonephritis. Boils and skin abscesses were present in 13, bronchitis and bronchopneumonia in seven. A stubborn mucopurulent nasal discharge indicated sinusitis in 6 cases. Three had an infectious diarrhoea.

#### TREATMENT AND RESULTS

Four patients died, 71 recovered, and of these 3 were not seen after the first examination. Of the remaining 68, 57 had their tonsils and adenoids removed, and 11 were not operated on. Of these eleven, 6 seen before 1926 were treated with balanced diet, ultra-violet radiation and heliotherapy in the summer. Their average duration of illness was between seven and eight months. It was decided about 1926 to advocate removal of tonsils and adenoids in all cases. Of the remaining 5 not operated on 4 were mild and recovered under expectant treatment, with an average duration of illness of about five months. The other, case 57, is mentioned specially as she was treated with

thiamin chloride, one-tenth mg. three times daily for two months, with no improvement. She was then given one-half mg. subcutaneously three times a week for one month. Nevertheless, at the end of this period there was no improvement. She ultimately recovered without tonsillectomy after a duration of illness of ten months.

In classifying these cases as to severity, 17 were incipient or mild, 58 typical and severe. Of the 17 less severe 4 recovered by expectant treatment and 11 were operated on. In a disease so chronic as acrodynia it is possible to pick up some cases in their incipiency. Of the 57 cases operated upon 30 recovered rapidly, 18 moderately rapidly and 9 more slowly. The total average duration of illness of these 57 cases was less than three and one-half months. Those recovering rapidly showed improvement in disposition and strength as soon as within a week following operation. It was felt that had they not been operated on their duration of illness would have been much longer, probably around six months. Rocaz<sup>4</sup> stated, "I consider that the average duration is about six months". Six cases operated on which recovered slowly were found to have persistent nasal discharge following operation and were treated by their otolaryngologist for sinus infection, and ultimately recovered. Cases were not sent up for operation when there was any doubt as to their general condition, and intravenous fluids and blood transfusions were given freely. There were no post-operative deaths and only a few required special post-operative treatment. Actually it was felt that these pitiable infants are far more tenacious of life than one is led to expect by their appearance. Ether was administered in all cases by a trained anæsthetist, with ethyl chloride induction in some. Fulton, Livingstone, Morrison and Ross<sup>5</sup> reported 4 post-operative deaths in 17 cases. With a few exceptions, as none of these cases appeared to be any worse post-operatively, it was felt that when properly prepared acrodynia is not a poor risk for surgical interference.

Sulfanilamide and sulfapyridine were used in some cases, but it was not felt that other than for complications there was any benefit therefrom.

There were 4 deaths, one with bronchopneumonia and endocarditis, and 3 with bronchopneumonia, which gave a mortality rate of a little over 5 per cent. These patients died before the advent of modern chemotherapy.

### Etiology

The following have been put forward as causes of acrodynia.

1. *A lesion in the diencephalon or mesencephalon of the nature of encephalitis.*—This has been suggested by some European authors. Rocaz<sup>6</sup> stated "After reviewing all the available evidence I consider the facts are extremely suggestive that 'pink disease' is an inflammation of the nervous system". Bilderback<sup>7</sup> stated that: "Up to the present time no characteristic pathology has been found in the disease". In the hundreds of cases reported no mention is made of any sequelae such as one would expect to find from organic disease in the central nervous system. Cases recover so completely that serious consideration cannot be given to the opinion held by a few that this is an organic disease of the nervous system. In this series two autopsies were performed but no histopathological study was made of the nervous system.

2. *Vitamin deficiency.*—It was but natural that because of its bearing on beri-beri, thiamin chloride should have been tried out in this disease. Forsythe<sup>8</sup> treated three cases with B complex alone, and one with B<sub>1</sub>, and stated: "The results obtained in the four cases have been encouraging". Williams, Shapiro and Bartelot<sup>9</sup> reported a case which responded immediately to intramuscular injections of betaxin, 2 mg., three times a week. Pehu and Boueomount<sup>10</sup> used vitamin B and nicotinic acid, and stated: "Results have not been consistent". Paterson<sup>11</sup> gave five patients large doses of B intramuscularly with mixed results, one child appearing to improve rapidly, three others remaining the same. Seven of the cases reported in this series were given thiamin chloride by mouth and by injection, and, except for slight improvement in appetite, their condition appeared much the same. Case 57 has been commented on as illustrating the failure of thiamin chloride in curing acrodynia. Because of a certain similarity of the skin lesions in pellagra with those of acrodynia it was natural that nicotinic acid should have been tried. Jahr and Dornberger<sup>12</sup> reported a three year old girl responding rapidly to nicotinic acid, but Tisdall, Drake and Brown<sup>13</sup> treated six infants with nicotinic acid and concluded, "that it had no demonstrable effect on the clinical course of the disease as a whole". Schneider, Steenbock and Platz<sup>14</sup> reported the

curing of rat acrodynia by rice-bran concentrate, the action being dependent on B<sub>6</sub> and a secondary accessory factor. On enquiring as to whether rat and infant acrodynia are similar, the following communication was received from the University of Wisconsin, "Acrodynia in rats can be caused by many deficiencies, and it is rather a blanket term for the loss of hair, spectacle eye, and sore feet. It can be occasioned by the absence of certain fatty acids, pantothenic acid, inositol, and B<sub>6</sub>. It is so complicated that one can hardly use the term acrodynia as indicating specific known deficiencies." It is likely that there is no association between these two diseases.

The evidence is against avitaminosis. In this series 60 per cent of the cases had been breast-fed and about 50 per cent were considered to have been fed a well balanced diet. It is improbable that their diets could have been deficient enough to occasion such a deep seated illness.

3. *Smut-infected cereals.*—Clements<sup>15</sup> stated: "In Jugo-Slavia, Mayerhofer and his associates have incriminated the spores of a cereal smut as the cause of acrodynia occurring in that country, but concluded there is no evidence to suggest that smut infected cereals play any part in the etiology of 'pink disease' in Australia".

4. *Hypervitaminosis D from too much sunlight.*—It has been advocated by Braithwaite that excessive sunlight in hypersensitive individuals is a cause of acrodynia. Against this is the experience of many physicians that acrodynia is commoner in the winter and spring months. Actually the opposite has been maintained, that is, that acrodynia may be due to a hypo-vitaminosis D, but so many cases failed to respond to helio- and photo-therapy that this opinion has been discarded.

5. *Arsenical poisoning.*—In districts such as western Canada where considerable arsenic is used for gopher and grasshopper extermination, this has to be considered. However, one would expect to find all ages affected and confirmatory laboratory findings.

6. *Allergy.*—It is possible that some of the cutaneous reactions are the result of hypersensitization to the toxin of acrodynia. There is no evidence that this disease belongs to the allergic series.

*7. Infection.*—There is nothing new about the contention that respiratory infection is the cause of acrodynia. Byfield in 1920, and Brown, Courtenay and McLaughlan in 1921, stressed this. Rodda<sup>16</sup> in 1925 reported, "It is probably the result of focal infection", and, "removal of tonsils and adenoids has been followed by speedy recovery in all patients". In this series, in the 57 patients who had their tonsils and adenoids removed recovery was spectacularly rapid in 30 cases, moderately rapid in 18, and slow in 9 instances. It was felt that the slower cases harboured infection in the upper air passages. Nevertheless, the average duration of illness of this series was slightly under three and one-half months, and when it is considered that six months is a moderate estimate for the average duration of illness of acrodynia it is again submitted that this disease is probably caused by an upper respiratory infection, and removal of tonsils and adenoids offers the best form of treatment.

#### SUMMARY

1. A report is made of 75 cases of acrodynia, 57 of which were treated by removal of tonsils and adenoids, with an average total duration of illness of less than three and one-half months. As the average duration of illness of acrodynia is about six months, it is submitted that acrodynia is due to a toxæmia caused by infected tonsils and adenoids.

2. Four families are reported; three families had two cases each and one family three cases.

3. One case was reported as having been almost identical with Oppenheim's disease.

4. One case was treated for three months with thiamin chloride by mouth and subcutaneously, with a duration of illness of ten months.

5. Modern chemotherapy did not appear to influence the course of this disease except where complications were present.

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#### A REVIEW OF MEDICAL BOARDS\*

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A MEDICAL board from the personnel of No. 15 Canadian General Hospital was constituted as a Standing Medical Board on March 11, 1940. It continued to function as the only medical board for the C.A.S.F. Overseas until August 15, 1940, at which time other medical boards were set up at various centres. Since that time the personnel of the above board has continued to function at No. 15 General Hospital, dealing only with patients in hospital.

From March 11, 1940, to December 31, 1940, 1,274 boards had been completed on 1,227 soldiers, the greater number in the period pre-

ceding August 15, 1940. In May, 1940, a review of 400 consecutive boards was made. It was felt that a further report on the total boards to December 31, 1940, might be of value, particularly as the personnel on the board insured continuity of viewpoint in dealing with the problems brought before it.

Table I gives a summary of these boards. They have been classified into sections based on the official Nomenclature of Diseases and arranged in the order in which loss to the services overseas have occurred. It will be noted that of the 1,227 boards 839 or 68.3 per cent were placed in a category for return to Canada. For special reasons connected with the nature of the

\* From Medical Division No. 15 General Hospital, R.C.A.M.C.

TABLE I.  
SUMMARY OF BOARDS

Diseases	Boards	Reboards	Number personnel boarded	A	B	C	D	Returned to Canada	Percentage returned to Canada	Percentage total boards returned to Canada	Percentage total returned to Canada
Digestive system.....	279	2	277	1	1	5	.	270	97	22.0	32.2
Bones and joints.....	228	8	220	15	15	61	4	125	54	10.2	15.0
Mental disease.....	126	2	124	4	1	13	1	105	83	8.5	12.6
Diseases of chest.....	107	15	92	..	4	12	.	76	71	6.2	9.0
			713					576		46.9	68.8
Cardiovascular.....	100	14	86	4	6	13	10	53	53	4.4	6.3
Injuries.....	107	1	106	15	18	22	8	43	40	3.5	5.0
Nervous system.....	38	..	38	1	.	.	.	37	98	3.0	4.4
Miscellaneous.....	109	4	105	29	7	29	7	33	30	2.7	4.0
Ear, nose and throat.	66	1	65	1	5	24	2	33	50	2.6	4.0
Eye.....	67	..	67	..	2	39	..	26	39	2.2	3.0
Genito-urinary tract..	24	..	24	..	.	2	.	22	91	1.7	2.6
Metabolism and blood	10	..	10	..	.	.	.	10	100	0.8	1.2
Infections.....	13	..	13	3	..	3	1	6	46	0.5	0.7
Totals.....	1,274	47	1,227	73	59	223	33	839	..	68.3	100.0
Percentage totals...			3.8		6.0	4.8	18.3	2.6	68.3		1

disability 33 or 2.6 per cent were placed in category "D" for treatment in England; ordinarily such cases do not require special categorization; 355 or 29.1 per cent were placed in categories "A", "B", or "C" and referred for duty in those categories.

Diseases of the digestive system, bones and joints, mental disease and diseases of the chest, in that order account for 713 or 58 per cent of all boards. Of these, 576 or 46.9 per cent, were placed in a category for return to Canada. That is, of the 68.3 per cent rejections, 46.9 per cent or over two-thirds were due to a disability in these groups. It would appear, therefore, that the problems of the medical services overseas at this stage of the war have largely to do with this group.

An analysis of the diseases of the digestive system responsible for invaliding is found in Table II. It will be noted that of the 270 rejections 253 were due to gastric, duodenal or stomal ulcer. That is, 21 per cent of all boards and 31 per cent of all rejections were due to peptic ulcer. This would seem a relatively high percentage and is due in part to the early establishment of the policy of return to Canada of troops suffering from peptic ulcer.

This policy is based on a number of considerations. Peptic ulcer is a recurrent disease, its initiation and recurrence being dependent on factors not definitely known. It is certain, however, that the neurogenic factor is a predominant factor and that army life entailing the added strain of unaccustomed living conditions etc. is largely contributory. A large proportion of the cases seen are recurrences, as high as 84 per cent in the study previously reported. The treatment of these cases in hospital usually is prolonged and in view of the probability of recurrence is thought to be uneconomie. It also tends to reduce the margin of safety in hospital beds in areas which may become a theatre of war. This point of view as to the disposal of ulcer patients has recently been substantiated by the British authorities who now return to civilian life not only all cases of proved ulcer but also the so-called functional dyspepsia with a long-standing history of gastric disturbance.

TABLE II.  
DISEASES OF THE DIGESTIVE SYSTEM

	Boards	Reboards	Number personnel boarded	A	B	C	D	Returned to Canada
Gastric ulcer.....	24	..	24	..	..	..	..	24
Duodenal ulcer.....	233	2	231	1	1	..	..	229
Gastroenterostomy...	3	..	3	..	..	..	..	3
Diverticulitis.....	2	..	2	..	..	..	..	2
Intestinal obstruction.	5	..	5	..	..	2	..	3
Functional dyspepsia..	4	..	4	..	..	2	..	2
Chronic constipation..	1	..	1	..	..	1	..	..
Chronic cholecystitis..	4	..	4	..	..	..	..	4
Carcinoma of lip....	1	..	1	..	..	..	..	1
Carcinoma of stomach.	2	..	2	..	..	..	..	2
Totals.....	279	2	277	1	1	5	..	270

TABLE III.  
DISEASES OF BONES AND JOINTS

	Boards	Reboards	Number boarded	A	B	C	D	Returned to Canada
Arthritis.....	112	5	107	6	7	28	1	65
Deformities of feet.....	95	3	92	5	7	32	3	45
Osteomyelitis.....	2		2	1	..	..	..	1
Pott's disease.....	1		1	..	..	..	..	1
Paget's disease.....	3		3	..	..	..	..	3
Fibrocytic disease.....	1		1	..	..	..	..	1
Von Perthes.....	2		2	..	..	1	..	1
Sacralization.....	1		1	1	..	..	..	..
Scoliosis and kyphosis.....	3		3	1	..	..	..	2
Spina bifida.....	3		3	1	..	..	..	2
Synostosis.....	1		1	..	..	..	..	1
Tenosynovitis.....	4		4	..	1	..	..	3
Totals.....	228	8	220	15	15	61	4	125

Of the 220 boards on soldiers with disease of the bones and joints (Table III), 107 were brought forward for various types of arthritis; 92 were for various deformities of the feet of which 68 were for flat feet. These conditions constitute the larger proportion of this group. There were 65 rejections for arthritis and 45 for deformities of the feet of which 34 were for flat feet. This whole group accounts for 10.2 per cent of the total boards and 15 per cent of all rejections. A larger number (61) of these soldiers was placed in category "C" than in any other single group, and 8 of these were subsequently reboarded to a lower category. It follows, therefore, that as a cause of disability this group ranks relatively high. It is not improbable that further reductions in category may ultimately become necessary. Since the arthritics are found mainly in the older age class the attention of examining boards should be drawn to the need for a more careful assessment of the older man. A strict watch also should be kept for structural deformities which may become a cause of disability.

Mental disease accounts for 8.5 per cent of all boards or 12.6 per cent of all rejections in this series. For the sake of brevity they have been classified under certain broad groups in Table IV. There were 16 mental defectives returned to Canada. For the most part they were behaviour problems not amenable to discipline because of their deficiency. The functional psychoses account for 25 rejections. These psychoses had developed under minimal strain and it was felt that even if recovery did take place the liability of recurrence precluded re-

TABLE IV.  
MENTAL DISEASE

	Boards	Reboards	Number personnel boarded	A	B	C	D	Returned to Canada
Mental deficiency.....	22	..	22	1	..	5	..	16
Chronic alcoholism and drug addiction .....	4	..	4	..	..	1	..	3
Cerebrospinal syphilis.....	7	..	7	..	..	..	..	7
Functional psychoses.....	25	..	25	..	..	..	..	25
Psychopathic personality.....	27	..	27	..	..	2	..	25
Psychoneurosis.....	41	2	39	3	1	5	1	29
Totals.....	126	2	124	4	1	13	1	105

tention in the services. Twenty-five were returned to Canada on the basis of a psychopathic personality. In many of these cases there was a long pre-war history of industrial mal-adjustment as well as a poor service record. There were 39 individuals seen in the group of psychoneurosis of which 28 were anxiety states associated in many cases with psychopathic personality. Of this group 29 were returned to Canada, the balance being given an opportunity to return to duty in a lower category. Two of these were subsequently placed in category "E". Mental disease, therefore, accounts for the third highest proportion of wastage in the services. To some extent this might be prevented by attempting to catch these individuals on recruitment by obtaining as much information as possible about their previous personal and industrial history.

TABLE V.  
DISEASES OF THE CHEST

	Boards	Reboards	Number personnel boarded	A	B	C	D	Returned to Canada
Bronchitis.....	49	11	38	..	3	6	..	29
Bronchitis with asthma.....	24	2	22	..	..	1	..	21
Bronchiectasis.....	8	..	8	..	..	..	..	8
Asthma.....	12	2	10	..	1	4	..	5
Pulmonary emphysema.....	2	..	2	..	..	1	..	1
	95	15	80	..	4	12	..	64
Tuberculosis.....	5	..	5	..	..	..	..	5
Pleurisy with effusion.....	3	..	3	..	..	..	..	3
	8	..	8	..	..	..	..	8
Unresolved pneumonia.....	2	..	2	..	..	..	..	2
Lung abscess.....	2	..	2	..	..	..	..	2
Totals.....	107	15	92	..	4	12	..	76

APPENDIX  
DISEASES OF THE CARDIOVASCULAR SYSTEM

	<i>Boards</i>	<i>Reboards</i>	<i>Number personnel boarded</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>Returned to Canada</i>
Chronic endocarditis	10	1	9	..	..	..	..	9
Aortic stenosis	2	1	1	..	..	..	..	1
Aortic insufficiency	2	..	2	..	..	..	..	2
Mitral stenosis	1	..	1	..	..	..	..	1
Degenerative myocarditis	11	2	9	..	..	4	..	5
Coronary infarction	2	..	2	..	1	..	..	2
Arteriosclerosis	1	..	1	..	..	..	..	..
Peripheral vascular disease	1	..	1	..	..	1	..	..
Syphilitic aortitis	2	..	2	..	..	3	1	2
Hypertension	14	2	12	..	..	..	..	8
Hypotension	1	..	1	..	..	..	..	1
Raynaud's disease	2	1	1	..	..	..	..	1
Varicose veins	12	2	10	2	1	2	..	5
Varicocele	4	1	3	..	..	1	..	2
Thrombophlebitis	9	2	7	..	1	1	..	5
Hemorrhoids	1	..	1	..	..	1	..	..
Paroxysmal tachycardia	3	..	3	1	1	1	..	..
Effort syndrome	22	2	20	1	2	1	7	9
Totals.....	100	14	86	4	6	13	10	53

## INJURIES

	<i>Boards</i>	<i>Reboards</i>	<i>Number personnel boarded</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>Returned to Canada</i>
Old G. S. W. injury	31	..	31	7	11	7	..	6
Injuries miscellaneous	13	..	13	3	..	1	..	9
Fractures	26	..	26	2	3	8	3	10
Int. derangement knee	11	..	11	2	2	1	3	3
Recurrent dislocation	3	..	3	1	1	..	..	1
Amputation toes	3	..	3	..	..	1	..	2
Skin graft heel	1	..	1	..	..	..	..	1
Subdural hematoma	1	..	1	..	..	..	..	1
Nerve injuries	4	..	4	..	1	1	..	2
Plexus injuries	1	..	1	..	..	..	..	1
Nerve paralysis	4	..	4	..	..	2	..	2
Traumatic neuromata	1	..	1	..	..	..	1	..
Laceration muscle	1	..	1	..	..	1	..	1
Hernia muscle	1	..	1	..	..	..	..	..
Nuclear prolapse	3	..	3	..	..	..	1	2
Pellegrini—Stieda's dis	1	..	1	..	..	..	..	1
Necrosis of bone	2	1	1	..	..	..	..	1
Totals.....	107	1	106	15	18	22	8	43

## DISEASES OF NERVOUS SYSTEM

	<i>Boards</i>	<i>Reboards</i>	<i>Number personnel boarded</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>Returned to Canada</i>
Disseminated sclerosis	1	..	1	..	..	..	..	1
Sciatic neuritis	3	..	3	1	..	..	..	2
Intrathecal lipiodol	1	..	1	..	..	..	..	1
Neurofibromata	3	..	3	..	..	..	..	3
Paralysis agitans	4	..	4	..	..	..	..	4
Epilepsy	22	..	22	..	..	..	..	22
Migraine	1	..	1	..	..	..	..	1
Progressive muscular atrophy	2	..	2	..	..	..	..	2
Hemiplegia	1	..	1	..	..	..	..	1
Totals.....	38	..	38	1	..	..	..	37

## MISCELLANEOUS

	<i>Boards</i>	<i>Reboards</i>	<i>Number personnel boarded</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>Returned to Canada</i>
Physical inferiority	7	..	7	..	1	3	2	1
General debility	3	..	3	..	..	5	1	1
Over-age plus	28	3	25	..	1	2	17	20
Over-age alone	25	..	25	..	1	1	..	5
Pensioner	3	..	3	..	1	1	..	..
No apparent disease	21	..	21	..	..	..	..	..
Myalgia	2	..	2	..	..	2	..	..
Myositis	2	..	2	..	1	1	..	..
Hernia	15	1	14	..	3	1	..	4
Dermatitis	1	..	1	..	..	..	..	1
Mediastinal tumour	1	..	1	..	..	..	..	1
Old empyema	1	..	1	..	..	..	..	..
Totals.....	109	4	105	29	7	20	7	33

## DISEASES OF THE EAR, NOSE AND THROAT

	<i>Boards</i>	<i>Reboards</i>	<i>Number personnel boarded</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>Returned to Canada</i>
Deafness	26	1	25	..	1	13	..	11
Otitis media	30	..	30	..	3	11	..	16
Otosclerosis	4	..	4	..	1	1	..	2
Polyp in canal	1	..	1	..	..	..	2	..
Deviated septum	2	..	2	..	..	..	..	1
Sinusitis chronic	1	..	1	..	..	..	..	1
Carcinoma of throat	1	..	1	..	..	..	..	1
Laryngeal papilloma	1	..	1	..	..	..	..	1
Totals.....	66	1	65	1	5	25	2	32

## DISEASES OF METABOLISM, BLOOD, ETC.

	<i>Boards</i>	<i>Reboards</i>	<i>Number personnel boarded</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>Returned to Canada</i>
Diabetes mellitus	6	..	6	..	..	..	..	6
Diabetes insipidus	1	..	1	..	..	..	..	1
Hyperthyroidism	1	..	1	..	..	..	..	1
Pernicious anemia	1	..	1	..	..	..	..	1
Hemophilia	1	..	1	..	..	..	..	1
Totals.....	10	..	10	..	..	..	..	10

## INFECTIOUS DISEASES

	<i>Boards</i>	<i>Reboards</i>	<i>Number personnel boarded</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>Returned to Canada</i>
Rheumatic fever	4	..	4	..	..	2	1	2
Meningitis	3	..	3	..	1	..	1	1
Poliomyelitis	2	..	2	..	1	..	1	1
Chronic infection	1	..	1	..	..	..	..	1
Typhoid carrier	1	..	1	..	1	..	..	1
Syphilis	1	..	1	..	..	..	..	..
Totals.....	13	..	13	3	..	3	1	6

## DISEASES OF THE EYE

	Boards	Reboards	Number personnel boarded	A	B	C	D	Returned to Canada
Amblyopia	16	16		1	14			1
Amaurosis	1	1			1			
Myopia	7	7			3			4
Astigmatism	2	2				2		2
Central scotoma	2	2				5		8
Blindness	13	13				1		
Night blindness	1	1						
Keratitis	2	2						2
Cornical scar	2	2				2		
Cataract	6	6		1	2			3
Dislocation of lens	1	1			1			
Choroiditis	3	3			2			1
Diplopia	1	1			1			.
Squint	2	2			2			
Enucleation of eye	1	1						1
Macular degeneration	2	2			1			1
Retrobulbar neuritis	1	1						1
Optic atrophy	1	1						1
Injury to eye	3	3			2			1
Totals	67	67		2	39			26

## GENITO-URINARY DISEASES

	Boards	Reboards	Number personnel boarded	A	B	C	D	Returned to Canada
Chronic nephritis	2	2			1			2
Pyelonephritis	3	3						2
Hydronephrosis	1	1						1
Nephrolithiasis	4	4			1			3
Carcinoma of bladder	1	1						1
Ureteral stricture	1	1						1
Hydrocele	2	2						2
Hypospadias with G C	1	1						1
Carcinoma of testicle	1	1						1
Epididymitis	1	1						1
Enuresis	7	7						7
Totals	24	24			2			22

The group of diseases of the chest accounts for 6.2 per cent of the total boards and 9.0 per cent of the rejections. These are set out in Table V. It will be noted that there are only 5 cases of pulmonary tuberculosis and 3 of pleurisy with effusion, probably tuberculous in origin. This number constitutes a relatively low percentage of tuberculosis for this age group and is undoubtedly due to the routine survey of chests at the time of enlistment. The bronchitic group of diseases accounts for the larger proportion of the diseases of the chest and is of particular interest. Sixty-four of the 80 patients seen were returned to Canada, and on these 15 reboards had been done. On reboard 12 were subsequently placed in category "E", it having been found that they were unable to carry on in a higher category. Many of these

cases had had repeated periods of hospitalization with apparent recovery but return to service conditions precipitated a recurrence. These cases are still a problem, in that their disability seriously interferes with active training, and as a result they are often ineffectual for considerable periods of time. It would seem advisable, therefore, once it has been established that such is the case that these troops be placed in a category for return to Canada.

The above groups constitute the main causes of wastage in the overseas forces. The remaining groups will not be separately charted nor discussed in detail. Some points of interest, however, will be brought out.

In the group of cardiovascular disease 53 of the 86 cases were returned to Canada; 4 cases were invalidated for valvular disease, 5 for myocardial disease, 14 for diseases of the arteries and 12 for diseases of the veins. Arterial hypertension was the largest single cause for invaliding in this group and often was associated with over-age; 20 cases of effort syndrome are included in this group. Of these, 9 being of long standing were placed in category "E", the remainder being less severe were either referred for treatment or returned to duty in a lower category.

The group of injuries (105 cases with 43 rejections) involved damage to bones, joints, nerve and muscle. A large proportion of these were injuries resulting from the last war and boards were required to reassess the disability. Over one-half of the rejections were in this group. A relatively small proportion were due to injuries occurring in this war.

Because of diseases of the nervous system 37 of the 38 cases seen were returned to Canada. There were 22 with epilepsy in this group, 4 with paralysis agitans, 2 with progressive muscular atrophy and one case of disseminated sclerosis. These were for the most part long standing conditions.

The miscellaneous group of 104 boards includes 50 over-age personnel: 25 of these were boarded on the basis of over-age alone, it having been found that they simply were unable, for one reason or another, to stand up to category "A" demands. Seventeen of these were placed in category "C", only 5 being rejected. Twenty-five were boarded on the basis of over-age plus some other disabling condition. As might be expected, the most common additional factor was arthritis, the second cardiovascular disease

—usually hypertension—and the third bronchitis: 20 of these were placed in a category for return to Canada. The remainder of this group is made up of such oddments as 21 boards on soldiers with no apparent disease brought forward for a variety of reasons; herniae, of which there were 14; and such conditions as physical inferiority, general debility, etc., which do not fit easily into any scheme of classification.

Diseases of the ear, nose and throat account for 65 boards with 33 rejections. These were brought forward for the most part because of deafness and chronic otitis media. Of the 67 boards on patients with diseases of the eyes, the 26 rejections were for blindness due to one cause or another.

The group of genito-urinary disease is interesting largely because of its relative position in the scale. There were 24 cases boarded with 22 rejections: 8 of these were due to kidney disease, a figure which might have been much larger had not routine urinalysis been carried out at the time of enlistment. There were 7 cases of enuresis included in this group.

The 10 boards on soldiers with disorders of metabolism or blood diseases included 6 cases of diabetes mellitus—again a small figure—a case of diabetes insipidus, one of pernicious anaemia, one case of haemophilia and a case of hyperthyroidism.

The infectious disease group included in the 6 rejections 2 cases of old rheumatic fever, one case of meningitis with residual damage, one pre-war poliomyelitis with residual damage and a typhoid carrier. Only one of these cases, the meningitis, was post-war in origin.

From a consideration of the disabilities responsible for loss of personnel to the Canadian Forces overseas as shown in the above report, it would appear that medical boards overseas have been concerned largely with reassessment of the soldier with a disability in the light of

the conditions overseas. The loss of personnel is not so much the wastage of war as it is the wastage of civilian life in the age groups concerned. The incidence of disability and the causative factors would seem comparable to that of civilian life, the difference being that the disabled soldier invariably goes sick, while the civilian often struggles along without medical attention. Disabilities due to the conditions imposed by war have been to date a relatively small factor. The small percentage of troops invalidated from such conditions as could be detected through the survey of chests and routine urinalysis on recruitment amply demonstrates the value of such procedures. It follows that thorough investigation of soldiers presenting themselves with other disabilities during their service in Canada might serve to prevent many of them from proceeding overseas and so prolong their usefulness in the services.

#### SUMMARY

1. One thousand two hundred and seventy-four boards on 1,227 soldiers in the C.A.S.F. overseas have been reviewed.
2. Diseases of the digestive system, bones and joints, mental disease and diseases of the chest in that order are responsible for over two-thirds of the cases invalidated to Canada and to date provide the problems for the medical personnel overseas.
3. The diseases most frequently met with in this group are: peptic ulcer, arthritis, deformities of the feet, the psychoses and bronchitis with or without asthma.
4. The other conditions responsible for invaliding have been listed and discussed briefly.
5. It is to be noted that pulmonary tuberculosis, diabetes mellitus, and the nephritis are relatively insignificant causes of invaliding, undoubtedly due to the survey of chests and routine urinalysis on recruitment.

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**BLACK MARKET IN COSMETICS.**—The development of a black market in cosmetics, and the manufacture of them under unsuitable conditions, has resulted in cases of dermatitis and other diseases among users. A new Order has been introduced which will, it is hoped, confine the

manufacture of cosmetics mainly to those who are established in the business, and whose products have been properly tested and made in hygienic conditions.—*London Weekly Times*, November, 1941.

## CANADA'S SUPPLY OF ARMY DOCTORS\*

By WILLIAM J. DEADMAN, B.A., M.B.

*Hamilton, Ont.*

REFERENCES to a shortage of doctors in Canada, based on the statement that 1,300 of Canada's 11,000 physicians were in service with the armed forces, have, over the past six months been appearing in the lay press. Some months ago, a morning paper in an editorial entitled, "A Shortage of Army Doctors" made the statement, "It is disconcerting to learn that there is a shortage of doctors in Canada, notwithstanding the fact that the Canadian Army has not yet been in action, and casualties in the armed forces have been trivial, compared to the heavy toll of killed and wounded during the Great War". Certain other periodicals have drawn attention to an alleged, "acute shortage of doctors".

Such statements may well occasion some concern to the public; they will undoubtedly surprise those older members of the medical profession whose memories go back to 1914-1918; and in view of their possible effect on the recruiting of physicians, they most certainly call for careful examination. The survivors of the more than 3,000 physicians who served in the last war, those physicians now in service, and any others familiar with the fact that, in 1918, Canadian Medicine contributed more than 35 per cent of its personnel to the cause, will be inclined to resent any inference that, with but 18 per cent of Canada's physicians in service, there should already appear to be a shortage of doctors, either for the services, or for the civilian population. When Canada and Canadian medicine shall have put forth a total effort, evidences of relative shortage may appear, but at a time when only about 18 per cent of physicians have been absorbed by the armed forces, the suggestion of a shortage, either for the services or for the civilian population, is not to be justified by the facts, nor can it be supported by reference to a comparison of the figures of 1918 with those of 1941.

It will, I think, be admitted that in an emergency such as this, the interests of the armed forces must be paramount. The interests of the civilian population are necessarily sub-

sidiary. In extremity, medical service to the civilian population, in common with many other necessities, may need to be rationed. I am not aware that, in 1918, with 35 per cent of medical personnel in military service, the legitimate needs of the civilian population suffered to any great extent.

Let us therefore "look at the record". In 1918, Canada had approximately 7,800 doctors; 416 were serving with the Royal Army Medical Corps; 2,873 were in service with the Canadian Armed Forces; a total of 3,289 or more than 35 per cent of Canada's physicians were in service. At this date (November 29, 1941), of 11,000 physicians, Canada has 43 with the Royal Army Medical Corps, 1,832 with the Canadian Armed Forces, a total of 1,875 or about 18 per cent. To date the evidence will scarcely support any hypothesis of a shortage for either civilian or military requirements.

Singularly little information has been furnished the rank and file of physicians concerning the medical needs of the services, the part played in the last Great War, or the crying need for medical officers in the Royal Army Medical Corps. Lamentably little appeal has been made to the emotions or patriotism of the younger members of the profession. Nevertheless, the medical officer needs of the Canadian Armed Forces have, to date, been met, and a start has been made in supplying for service with the Royal Army Medical Corps, the hundreds of young medical officers so sorely needed by the Motherland, and so gladly and gallantly supplied in 1914-1918. To suggest that with but 18 per cent in the services, there is danger of a shortage is to suggest, in effect, either apathy on the part of the profession toward military service, or conversely, a markedly decreased willingness or ability to make greater efforts in the care of the civilian population so as to spare physicians for the services (82 per cent being required for civilian service as against 65 per cent in 1918). When viewed in the light of the record of 1914-1918, any such suggestion is manifestly unfair. There must still be a reservoir of at least 1,000 physicians under the age of 35, and a further 1,000 under the age of 40

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upon which to draw. Those who are familiar with the remarkable contribution made by Canadian medicine to the struggle of 1914-1918 will not doubt the willingness or the ability of the profession of 1941 to emulate the splendid example then set, or to match the accomplishments of those years, if and when the whole picture of those accomplishments and of present needs be clearly placed before it. The spirit of 1914-1918 still lives.

Comparatively speaking, there cannot possibly be any general shortage as yet. There are doubtless isolated instances of local shortage; the fault, if any, lies with our system, or lack of system. Any inference of a shortage of physicians in Canada, eligible for military service, cannot be supported by statistical data and is anything but complimentary to a profession with so glorious a record in Chapter I of this titanic struggle.

The medical schools, however, are to be commended for their vision and for, so to speak, "taking time by the forelock". The production of a physician has been a six year process; if it can be speeded up, without any deterioration of the training given (and of this we are assured) the benefit will be apparent when 25 per cent or more of physicians have been absorbed, an eventuality which may, of necessity, appear sooner than is anticipated. Any community can spare 25 per cent of its physicians without hardship to the public; the community with four physicians can spare one; that with 200 can spare 50; and that with 1,600 can spare 400. But those communities, organizations or institutions which lose more than 25 per cent of their medical personnel naturally experience a shortage, while those losing 10 per cent or less enjoy a relative surplus. The contribution of one-quarter of its physicians to the services is a reasonable yardstick whereby the profession of any community may measure its war effort. The accentuated production of physicians with adequate undergraduate and post-graduate training, is an excellent hedge against the day (and it may be soon) when 25 per cent or more of Canada's physicians are in the services. Should the response falter before this point is reached, the underlying cause is not to be found in a shortage, nor in any lack of the spirit of 1914-1918; it must be sought elsewhere.

The Canadian Medical Association is likewise to be commended for formulating the principle that each new graduate take at least one year's

internship, before entering the service. The fundamental reason is a sound one; all others are subsidiary to it. No citizen is entitled to more skilled or more experienced medical service than is the serving sailor, soldier or airman. He is entitled to the best his country can provide.

Medical schools do well to prepare in advance for the day when 25 per cent or more of the members of the profession are in service with Canada's Forces or with those of the Motherland. In 1918, it took 35 per cent of the profession to staff with medical officers a force of some 600,000 men. If Canada is to pull her full weight in this struggle for Canada's survival, her present population of twelve million will need to provide a force of nearly a million men, or three times the present force. It will be seen at a glance what this will mean in medical officer requirements; the wisdom of advanced planning in this regard can be appreciated. But at the moment, to leave in the mind of the public, or in that of the younger members of the profession the impression that the absorption by the armed forces of Canada of 13 per cent (at July 1, 1941) or even of 18 per cent (at November 30, 1941) is likely to produce a "shortage" for either military or civilian needs, is to fly in the face of the facts, and to hinder rather than help the prosecution of the profession's primary duty, to contribute to military service every available man, as required.

Let us be realists. Let us be honest with ourselves and with the public. Canada, on the basis of her effort in 1918, or of Britain's effort, or of Australia's effort, will in all probability eventually raise a force of a million men. Canada's 11,000 physicians have, as yet, been called upon to supply about 1,800 medical officers. From 3,600 to 4,000 will eventually be needed. There is an ample reservoir of physicians of military age upon which to draw, without jeopardizing the legitimate needs of the civil population. Let us not cry "shortage" while our reserves are ample. The psychologic effect upon the potential medical officer is bad. Until this struggle be resolved in our favour, the needs of the armed services are paramount. Let us face the facts.

Let us keep clearly before us the magnificent record of our fellows of 1914-1918. The late Sir Andrew Macphail, author of the volume dealing with the medical services in that struggle (*Official History of the Canadian Forces*) had this to say in closing: "The Canadian Army

held the field for four years without any of those failures in the Medical Service by which so many campaigns have been marred. The cause of this continual success was various. The service had been created in time of peace by Bergin, Neilson, Fiset and Jones; in time of war by Jones and Foster. The officers under command were skilled professionally, trained in medical schools of old excellence, imbued with a sense of loyalty

and discipline. Above all the service had been incorporated into the British Army; it was made partaker of all the traditions accompanying that privilege; it had the equipment and organization of that army to rely upon. Coming into such an inheritance, all that was required was intelligence, initiative and industry. The Canadian Medical Service proved, on the wide field of war, that it possessed those virtues."

## RESISTANCE TO INSULIN\*

BY EZRA LOZINSKI, M.D. AND LOUIS I. FROHLICH, M.D.

*Montreal*

RESISTANCE to insulin may be considered to be present when extraordinarily large amounts of insulin are required to control the hyperglycæmia and ketonæmia in a patient ill with diabetes mellitus. Patients temporarily requiring very large doses of insulin, as in coma, and severe infection, should not be classed as resistant. The term is purely relative since in all cases hyperglycæmia and ketonæmia can be reduced if sufficiently large doses of insulin are administered.

From the experiments of Hedon and Macleod on depancreatized dogs, Root<sup>1</sup> has estimated that a completely depancreatized man would require between 200 and 300 units of insulin daily. He has assumed that any diabetic who requires more than the above amount is resistant to insulin.

The condition, although not common, has been observed a number of times with varying degrees of severity.

Lawrence<sup>2</sup> reported on a 19 year old boy who while taking 200 units of insulin daily excreted 55 grams of glucose daily; on one occasion he was given 400 units without effect on the glycosuria. Glassberg, Somogyi and Taussig<sup>3</sup> reported a diabetic who took 317 units of insulin daily, and who required 1,100 units during one day when acidosis supervened. This patient later improved spontaneously and behaved like an ordinary diabetic. Root<sup>1</sup> recorded the case of a physician, age 52, who had cirrhosis of the liver and haemachromatosis, and who in spite of receiving 100 units of insulin daily was in acidosis and excreted 40 to 90 grams of glucose. His dosage was increased to 840 units daily. Despite this he went into coma and died even though 1,680 units of insulin was injected. Allan and Constam<sup>4</sup> observed a man with haemachromatosis for two months who took 500 units of insulin daily. Wegener's<sup>5</sup> patient required 300 units of insulin daily. Wood and Fitzhugh<sup>6</sup> used 175 units on their case without affecting the glycosuria. Engel's<sup>7</sup> patient was given 1,365 units of insulin daily just before death. The patient did not die of acidosis. Karr, Scull and Petty's<sup>8</sup> case received between 470 to

620 units daily. Various types of insulin were used without success in an attempt to overcome the extreme insulin resistance. They sensitized rabbits with the patient's serum and administered 5 c.c. of sensitized rabbit's serum to the patient. In one week the daily dosage of insulin was reduced to 150 units and was discontinued in one month. Labbe and Boulin<sup>9</sup> reported a case who was given 3,850 units of insulin in 13 days. Rudy<sup>10</sup> reported a mild diabetic with urticaria and temporary insulin resistance requiring 515 units daily. This was discontinued after eleven days. Edgar Wayburn<sup>11</sup> recorded a case in which diabetes mellitus and pulmonary tuberculosis coexisted. - The highest amount of insulin given her was 415 units in one day. This patient eventually went into coma and died. Clay and Lawrence's<sup>12</sup> case received 160 units of insulin every four hours but died a cardiac death. Altshuler and Gould<sup>13</sup> reported a case of diabetes mellitus in whom autopsy revealed a suprasellar cystic haematoma compressing the anterior and posterior lobes of the pituitary gland. This individual had glycosuria and acetomuria despite the administration of 100 units of insulin daily. Larger amounts were not tried. Marble<sup>14</sup> reported a case of extreme insulin resistance of long duration. He stated that this was the only case of its kind he had encountered amongst the 11,500 cases of diabetes mellitus he had treated in his clinic. This patient required between 240 and 675 units daily. When more than the latter amount was given hypoglycaemic reactions ensued. Weiner's<sup>15</sup> patient was first controlled by 50 units of zinc protamine insulin, but several months later needed 2,200 units daily. The patient recovered spontaneously so that 440 units was sufficient to control the glycosuria.

## PATHOLOGY

The post mortem findings throw no light on the etiology of extreme insulin resistance. One feature common to all these cases is some alteration in the histology of the liver. The case reported by Root<sup>1</sup> showed haemachromatosis in practically all the organs; being especially marked in the pancreas, liver and adrenals. In addition the liver showed periportal cirrhosis and the pancreas was almost completely replaced by fat and fibrous tissue. Clay and Lawrence's<sup>12</sup> patient presented congestion and slight fatty degeneration of the liver. All the endocrine glands were normal. The pancreas had a normal amount and normal appearing islets of

\* From the Metabolism Service, Jewish General Hospital, Montreal, Canada.

Langerhans. Wayburn's<sup>11</sup> case had pulmonary tuberculosis. The pancreas microscopically showed slight fatty infiltration with normal appearing islets of Langerhans and acini. The liver also presented fatty infiltration. There was no glycogen in the liver and pancreas. Altshuler and Gould's<sup>13</sup> patient had a suprasellar cystic haematoma. The liver had irregular areas of fatty infiltration, but the pancreas and adrenals were normal.

#### CASE REPORT

A Jewess, aged 61, first came under observation on April 23, 1936; complaining of pruritus vulvae of six weeks' duration. She had no other significant complaints. Her past history was uneventful except for the treatment of metrorrhagia in 1933 with radium. She had eleven children and no miscarriages. Physical examination—essentially normal findings, blood pressure, 150/90, weight, 126 lbs. The urinalysis showed a four plus glycosuria and no acetone. The fasting blood sugar was 139 mg.

Sugar tolerance test on April 30, 1936, gave the following results:

	Blood sugar mg. per cent	Glycosuria
Fasting . . . . .	160	0
½ hour . . . . .	224	2 plus
1 hour . . . . .	272	4 plus
2 hours . . . . .	345	4 plus
3 hours . . . . .	284	4 plus

She was placed on a restricted diet which was gradually increased to yield 1,750 calories daily and which contained—protein 60 g., fat 45 g., carbohydrate 265 g. On this regimen glycosuria disappeared and the fasting blood sugars ranged between 127 and 155 mg. She was thus adequately controlled until January 19, 1939, when glycosuria recurred despite strict adherence to her diet and despite the absence of any discoverable infection. She was given zinc protamine insulin, the dosage by June, 1939, being 40 units daily. She attended the clinic infrequently and it was known that glycosuria persisted.

On September 26, 1939, one of us (L.I.F.) was called to her home. The story was that at 5 a.m. on the previous day she began to vomit dirty dark brown material. The examination revealed an exhausted looking woman who was fully conscious. Her eyeballs were normal and the blood pressure was 180/90. The urine was loaded with sugar but contained no acetone. Hospitalization was advised but was refused. She resumed her usual diet of 1,750 calories and her insulin dosage was increased to 50 units zinc protamine insulin. This was progressively increased until on October 3rd, she received 112 units zinc protamine insulin and 38 units of plain insulin. On this day at 5 p.m. her blood sugar was 450 mg. A fasting blood sugar on October 23rd, after having received 160 units of zinc protamine and 200 units of plain insulin the day previously, was 299 mg. On October 26th, acetonuria appeared and hospitalization was insisted on. At this time she was taking 512 units of insulin daily.

On October 29th, three days after admission to hospital, she developed an acute pharyngitis which was accompanied by a temperature of 99.2. By this time the insulin dosage was 960 units daily. Sulfanilamide therapy was instituted and the pharyngitis cleared up; but the fever and acetonuria persisted. On November 4th, she again began to vomit dirty dark brown material. The blood sugar was 399 mg. per cent and the CO<sub>2</sub> combining power was 24 vol. per cent. She was given 1,000

c.c. of 10 per cent glucose saline intravenously with 500 units of plain insulin subcutaneously. Subsequent to this 1,700 units of plain insulin were given in one day in divided doses. The vomiting and acetonuria disappeared and she developed insulin shock which was characterized by profuse perspiration. Blood sugar was 31 mg. per cent. Glucose by mouth and intravenously, brought relief. On November 5th, marked pyuria was discovered for the first time which practically cleared up after two days except for two to three pus cells per high power field, but the low grade fever continued. Intravenous pyelogram revealed bilateral hydronephrosis. Subsequently she received 3,000 units of plain insulin daily in divided doses which was sufficient to prevent acidosis, but glycosuria persisted. On November 30th, a palpable spleen was discovered. The liver had been felt to be three finger-breadths below the costal margin since her entry into the hospital. Because of these findings the diagnosis of hemochromatosis was suggested. This could not be substantiated since there was no pigmentation of the skin. A biopsy was not done.

She continued on the same dosage of insulin but with poor control, until December 2nd, when she developed a temperature of 104°. There was a red indurated area over the right thigh; the site of an insulin injection. Concomitant with this acetonuria and vomiting reappeared. To combat this it was necessary to administer 5,780 units of plain insulin with orange juice in 24 hours. The acetonuria and glycosuria disappeared and the temperature fell to 99°. No insulin shock occurred. The area of induration gradually subsided without surgical intervention. The low grade pyrexia ceased on December 8th. Following this episode it was necessary to give her between three and four thousand units of plain insulin daily. She was completely aglycosuric between December 18th and December 26th, when she was receiving 3,600 units of insulin daily. A.C. and p.c. blood sugars on December 21st were 81.5 and 167 mg. per cent respectively. There were the occasions when it was necessary to discontinue the insulin for 12 to 24 hours in order to prevent the onset of insulin shock, but the glycosuria and acetonuria reappeared in a matter of hours and insulin injections had to be resumed. The pendulum swung very readily and rapidly from one extreme to the other.

On December 28th, following the suggestion of Dr. J. B. Collip, of McGill University, we gave her, by mouth, the "medullotrophic principle obtained from primary alcoholic extracts of the pituitary gland"<sup>14</sup>; the dosage being 2 c.c. three times a day before meals. Concomitant with this the insulin dosage was reduced to 500 units daily, but acidosis recurred and persisted despite the increase of the insulin to 2,000 units daily. Finally after using this extract for one week it was discontinued, since it had not reduced the amount of insulin necessary to control our patient's diabetes mellitus. Dr. Collip<sup>15</sup> employed this extract on ordinary cases of diabetes mellitus and he reported a few cases in whom it caused some reduction in the glycosuria; in others it was ineffectual.

On January 3, 1940, x-ray irradiation of the pituitary gland was started. We felt we had given the patient ample time to recover spontaneously from her insulin resistance, as has occurred in some of the cases recorded in the literature. We also had a standard by which to compare the effectiveness of this therapy; for her insulin dosage at this time was between three and four thousand units daily.

Dr. C. Liebman, chief radiologist of our hospital, conducted this therapy. Based on reported experience he considered it desirable to give the treatment in diminishing dosage. The factors and technique employed were as follows: 175 K.V.P., 10 M.A., F.S.D., 50 cm. Field—6 x 8 cm. Filters, Cu. 0.5 mm. plus Al. 1.0 mm. Time 5 min.

This gave 136 r units (measured in air without back scatter) per field per treatment. The central ray was directed to the pituitary gland through 3 fields—frontal, right temporal and left temporal. Ten treatments were given to each field, a total of 1,360 r units per field and

4,080 r units total for the three fields. For the first eleven treatments two fields were irradiated on one day and one field the following day. After this one field daily was treated at a time. The sixteenth to the twentieth treatments inclusive were given every two days and the last four treatments were spaced three days apart. The entire irradiation covered the period from January 3rd to February 13th, inclusive.

During the first two days of the irradiation therapy insulin was discontinued. Acidosis rapidly supervened; the fasting blood sugar on January 5th being 462 mg. per cent. At this time, Ellis<sup>18</sup> method of employing insulin was adopted. This was done for two reasons; first, to be able to anticipate insulin shock, and second, to help improve her sugar tolerance. Twenty-five units of plain insulin with 200 c.c. of orange juice were given every hour for two days, but on this regimen she became progressively worse and on January 6th she again began to vomit dirty dark brown material. She also became stuporous and her face was flushed. To counteract this she was given 1,500 c.c. 5 per cent glucose saline with 1,000 units of plain insulin, in one single dose, intravenously. These measures removed the clinical signs of threatening coma but the acetonuria persisted. Following this episode, 50 units of insulin every hour was given with the diet, consisting of 1,000 c.c. of milk, and 100 grams of oatmeal divided into six equal parts. This regimen was adhered to from January 8th until January 13th. Her original diet of 1,750 calories was again resumed; the insulin dosage fluctuating between 300 and 960 units daily. During all this time she continuously excreted sugar and acetone, and she had lost 15 lbs. in weight. On February 14th, one day after the last irradiation treatment had been given, the acetonuria disappeared.

The patient continued to improve and was discharged from the hospital on March 18th, with instructions to take 880 units of insulin daily since this amount had kept her free from acetonuria, and allowed only a slight glycosuria.

At home her improvement was even more striking. One month after leaving the hospital her insulin dosage was 500 units daily. Nine months later 80 to 120 units was required. May 12, 1941, approximately 16 months after irradiation, her fasting blood sugar was 108 mg. on a dosage of zinc protamine insulin—40 units daily.

She has gained in weight and strength and at present weighs 130 pounds. She looks well and has resumed her usual household duties. The liver and spleen are no longer palpable but the hypertension has persisted. The pyuria has not recurred.

#### LABORATORY DATA

1. October 28, 1939.—X-ray of skull and sella turcica: no abnormalities noted.
2. November 7, 1939.—Urine sediment smear: no acid fast bacilli found.
3. November 22, 1939.—Blood Wassermann: negative.
4. November 23, 1939.—Intravenous pyelogram: bilateral hydronephrosis.
5. November 27, 1939.—Urine culture: *B. coli* found.
6. November 29, 1939.—Electrocardiograph: ventricular myocardial disease.
7. November 27, 1939.—Blood chemistry studies: non-protein nitrogen 25.1 mg. per cent; cholesterol 232.
8. November 29, 1939.—Haemogram: red blood cells, 4,000,000; white blood cells, 2,700; haemoglobin, 70 per cent.
9. November 29, 1939.—Icteric index: 6.7.
10. December 6, 1939.—X-ray of chest: no parenchymatous disease seen.
11. December 6, 1939.—Basal metabolic rate: plus 6 per cent.
12. December 6, 1939.—Blood culture: no growth.
13. December 27, 1939.—Reducing substance in urine: pentose 0; galactose 0; lactose 0. The sugar was completely fermentable.

#### SPECIAL INVESTIGATIONS

Studies were made to determine (1) whether the blood and serum of the patient contained an insulin antagonist; (2) whether the patient's blood contained an insulin destroying substance; (3) whether the patient excreted insulin in the urine.

These studies were attended by entirely negative findings.

#### ETIOLOGY OF INSULIN RESISTANCE

Our investigations threw no light on the etiology of insulin resistance in our patient. This is in accord with the experience of those who have investigated other cases.

The type and source of the insulin employed does not affect the insulin resistance, Marble<sup>14</sup> and Kerr, Skull and Petty.<sup>8</sup> Insulin made from the pancreas of various animals, such as beef, pork, etc., produced no alteration in the amounts of insulin necessary to control glycosuria. The use of zinc protamine and crystalline insulins likewise showed no advantages.

An insulin antagonist was not demonstrated in the blood, nor was it possible to demonstrate the presence of insulin in the urine of the patient. The experiment performed by Weiner<sup>15</sup> who postulated a "contra-insulin hormone", was repeated by us, and we too failed to demonstrate the existence of such a substance. Riddle<sup>16</sup> and Cope and Mark's<sup>20</sup> work on the rôle of the pituitary gland in diabetes mellitus was used as the basis for the experiments performed by Professor J. B. Collip and Dr. N. H. Neufeld, who also failed to demonstrate an insulin antagonist in the blood of our patient.

Levine, Hechter, Grossman and Soskin,<sup>21</sup> on the basis of the observation that *in vitro*, insulin is inactivated by sulphhydryl compounds, studied the glutathione content of the livers of normal and hypophysectomized animals and of animals with decreased sensitivity to insulin produced by injections of an anterior pituitary extract. They were able to show that the livers of the pituitary injected animals contained somewhat more glutathione than the normal and considerably more than the very insulin sensitive hypophysectomized animals. Hyperactivity of the pituitary may in this way account, at least in part, for insulin resistance.

The very opposite suggestion is advanced by Himsworth<sup>22</sup> who suggested that there is a deficiency of "an insulin activating substance" or factor in the body of patients with extreme re-

sistance to insulin. If this were so no amount of insulin would then be effective. However, it has been demonstrated that insulin resistance is only relative since if enough is given characteristic effects are observed.

Bruger and Friedman<sup>23</sup> have shown that rabbits excrete insulin, provided large enough quantities are injected. The possibility that our patient was excreting insulin in the urine was considered. Examination of the urine for insulin as previously described failed to show its presence.

#### TREATMENT

The management of a case of severe insulin resistance is beset by many difficulties. The wide fluctuations in daily requirement of insulin, demands constant vigilance if coma and insulin shock are to be avoided. The large and frequent injections place a severe strain on the co-operation of a patient, even one tenacious of life. The cost of the large amounts of insulin required may use up the entire family income.

Under the circumstances, any therapeutic measure, even though based on the slimmest theoretical grounds must be tried. In our case a reasonable time was allowed for spontaneous remission and when this seemed unlikely to occur, consideration was given to the possibility that reduction of secretory activity of the pituitary by x-ray irradiation of the area of the brain in which this organ lies might offer some relief.

Such a method of treatment has been reported by others. Pieri and Sarradon,<sup>24</sup> Merle<sup>25</sup> and Cannavo<sup>26</sup> obtained satisfactory responses. Marble<sup>14</sup> on the other hand failed to benefit his

patient. This procedure was carried out in our patient with the gratifying results already recorded.

It would be idle to speculate on the mechanism by which improvement was produced. Reduction in secretory or other modifications in the activity of the pituitary may have been the factor. On the other hand the radiations passed through the thalamic, hypothalamic and other regions of the brain. To what extent did this contribute to the results? And finally, the remission may have been entirely coincidental.

#### SUMMARY

1. A case of resistance to insulin has been described for whom 3,000 to 4,000 units of insulin daily were required to prevent hyperglycæmia, acidosis and coma.

2. Several experiments were performed in an attempt to demonstrate the cause of the refractoriness to insulin. None of these gave evidence of the presence of an anti-insulin or insulin destroying substance in the patient's serum, nor was evidence obtained to suggest that the patient excreted insulin in her urine.

3. The technique of irradiation directed to the pituitary gland and the very satisfactory response to this treatment in the case reported are described.

The authors wish to acknowledge gratefully, the co-operation received from Dr. M. A. Simon, Director of Laboratories, in connection with laboratory work.

Since this manuscript was prepared a paper on "Insulin resistance. Critical survey of the literature with the report of a case", Walter P. Martin, *J. Clin. Endocrinol.*, 1941, 1: 387, has come to our attention. This paper contains a complete bibliography of the subject.

A full bibliography can be found in the reprints of this article.

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CANADA BEGINS TO GROW CRANBERRIES.—Canada's first cranberry plantation at Lemieux, Nicolet County, Quebec, is expected to yield its first crop in 1943, according to an article by John Robitaille in the December issue of the *C.I.L. Oval*. Representing an investment of some \$100,000, the undertaking was begun in the spring of 1938 by Edgar Larocque. Canada now imports about \$500,000 worth of cranberries annually from the United States, but by 1950 it is expected that a large percentage

of Canada's present consumption will be produced domestically. The first requirement for the cultivation of cranberries is water and Mr. Larocque has built channels from nearby Lake Soulard and can flood his land in two hours should the need arise. Flooding kills insect pests but does not hurt the cranberries. Parasitic plants are destroyed with a spray of fuel oil and salt brine and weeds are kept down by a generous sprinkling of sand over the dark loam in which the plants are rooted.—C.I.L., December, 1941.

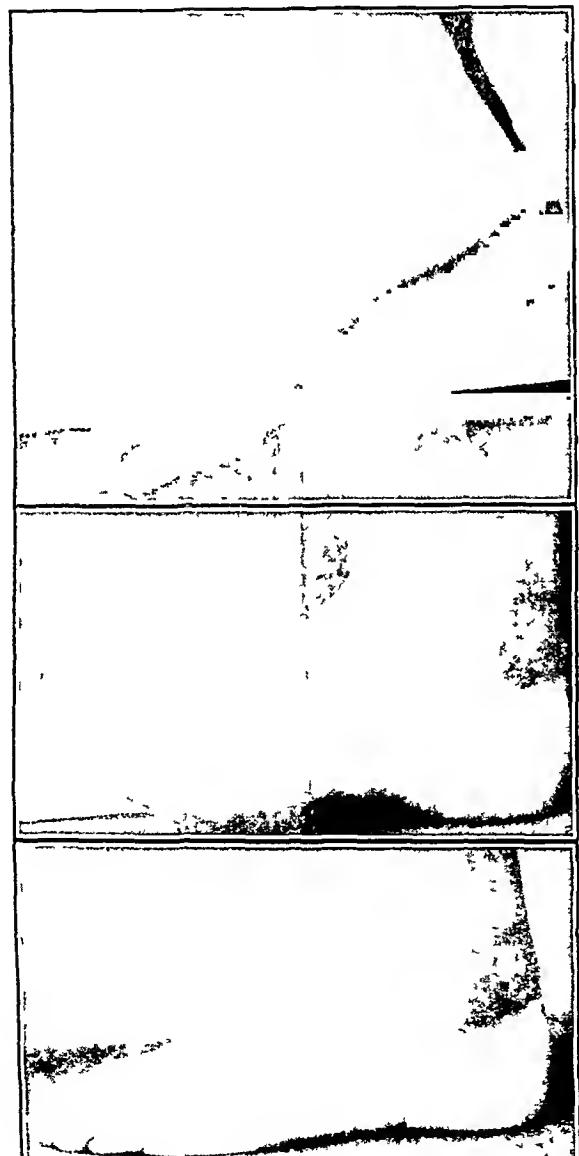
## Case Reports

### AVULSION OF TENDO ACHILLIS

BY JAMES B. MCCLINTON, M.B., B.Sc.(MED.)

*Timmins, Ont.*

Rupture of the tendo Achillis by voluntary muscle contraction is very rare. In younger adults it is even more so. In a group of 81,116 industrial accidents in 1940, reported by per-



sonal communication, there were none from violent muscle contraction. If a wolf can fang through this tendon in a deer his prey is easy. He does that first, then cuts the deer's throat.

A case referred by Dr. B. H. Harper and Dr. H. Lotimer, of South Porcupine, is of interest. The woman "hamstrung" herself. A married woman, 29, was playing badminton. She played a shot and was taking the next step when "something ripped". She "heard a snap" and "felt something give". She sat down and did not attempt to walk. Her physicians, noting the history, the ability to plantar-flex only slightly and a marked tender depression above the left heel, diagnosed ruptured tendo Achillis.

Under general anaesthesia the writer made a five-inch incision medial to the tendon site. The muscle portion had extended almost to the site of insertion. Little free tendon had been present. The fragments were widely separated and badly frayed. The plantaris tendon was separate and intact. It was about the size of a shoe lace. This had allowed a little voluntary plantar flexion. With the knee flexed, approximation with chromic catgut and silk was accomplished with difficulty. Bits of tendon-like structure were turned down from the upper fragment and attached to the sparse frayed lower fragment. The ruptured tendon was sutured to the plantaris. The skin was closed with interrupted silk.

With the foot slightly plantar-flexed and the knee flexed 75 degrees, plaster was applied from the tip of the toes to mid thigh.

Accompanying photographs show the foot in maximum flexion, extension, and in the standing position, fourteen weeks after rupture. The patient walks without a limp.

In all such procedures with ruptured tendons I believe permission should be obtained and preparation made for employing living suture from fascia lata.

## TWO CASES OF PRIMARY CARCINOMA OF THE FALLOPIAN TUBE

BY J. O. BAKER, M.D., C.M., F.R.C.S.(C),  
M.R.C.O.G., F.A.C.S. AND

THE HON. ARISTIDE BLAIS, B.Sc., M.D.,  
F.R.C.S.(C), Senator of Canada

Edmonton

Baron,<sup>1</sup> in reviewing this condition, in August, 1940, brought the total number of cases reported to February 9, 1939, to 363. To add two more to the list is the object of this article. An effort was also made to ascertain if any additional cases had ever come to the attention of the various pathologists in Alberta or had been reported to the Vital Statistics Branch of the Provincial Government. As far as could be determined, these were the only cases recorded in the province. Baron's above mentioned article, Henderson's<sup>2</sup> article and Martzloff's<sup>3</sup> cover the features of this rare condition quite fully, and we do not purpose to add to their reports, apart from a description of the two cases which have been observed in Alberta.

### CASE 1

Mrs. John C., Dr. A. Blais' patient, 40 years of age, was admitted June 14, 1927, to the Edmonton General Hospital with a history of pain of three days' duration in the right lower quadrant, relieved somewhat on lying down. There was a history of a previous attack several months ago which gradually passed off.

**Physical examination.**—On admission this revealed very marked tenderness over the whole of the right rectus muscle; some tenderness on the left side but not nearly so marked as on the right. Chest examination—negative. Urine examination—(catheter specimen)—normal. White blood cells, 13,200; temperature, 100°; pulse 90.

The patient was observed for three days. Hot stupes were applied to the abdomen, Fowler position, etc., and as she was still complaining of severe pain, with the temperature increasing to 101.2°, she was prepared for operation, which was performed by one of us (Blais) under ether anaesthesia on June 17, 1927.

**Operation.**—Both tubes and ovaries were removed and a large rubber drain inserted. The patient returned from the operating room in good condition, and, apart from some urinary difficulty for a few days, she did well and was discharged from the hospital on July 4, 1927.

**Operative findings.**—A large tumour of the left tube, ruptured; abdomen filled with blood clots; uterus showed a few small fibroids; right tube and ovary adherent to Douglas' pouch.

**Pathological report.**—(By Dr. J. J. Ower, Professor of Pathology, University of Alberta, Pathologist, Edmonton General Hospital.)

"1. Left tube and ovary. The middle third of the tube merges into a distal large encapsulated tumour, 12 x 8 cm. One surface of the tumour mass is broken down and has a lacerated appearance. The tumour on the cut surface has a fleshy nodular appearance, with areas of yellowish fatty appearing tissue. At the point where the tube merges into the mass is a caseous whitish nodule 2 cm. in diameter.

"2. Right tube and ovary to which is attached a small pedunculated nodule which on cut surface has

appearance of luteum tissue. Sections of the tube tumour show extensive caseous tuberculosis with calcification at middle third and distal to this; the tumour mass is composed of masses of epithelial cells in papillary and alveolar arrangement. There is evidence of primary proliferation of the mucosa of the tube. The cells of tumour show evidence of proliferation and rapid growth.

"Primary carcinoma of Fallopian tube superimposed on old tuberculous salpingitis."

The patient is still living and from our last report is enjoying good health.

### CASE 2

Mrs. M.Y., Dr. J. O. Baker's patient, a Ukrainian woman, 47 years of age. Previously always healthy. Came into the office on August 29, 1936, complaining of a swollen abdomen with some discomfort in the lower left quadrant. The swelling began six months previously. At that time she had an umbilical hernia. Three months before coming here she was operated upon for this rupture in a small country hospital and was told that she had carcinoma of the abdomen. Following the operation her abdomen continued to swell and caused her considerable embarrassment. The condition was quite insidious and painless until recently. Previous history negative. Her menstrual history has been constantly normal.

**Physical examination.**—Special senses essentially negative. Complexion rather pale. Respiratory system—some discomfort due to full abdomen. Cardiovascular—some cardiac palpitation recently since becoming distended. The abdomen revealed a recent transverse scar where the umbilicus had been removed in the hernia repair; quite distended; fluctuating with dullness in both flanks and up to the epigastrium. Dullness shifting somewhat on change of position. Pelvic examination—fluid could be felt in the cul-de-sac, but owing to distension a good bimanual examination was impossible. There was some oedema of the ankles. Pulse rate, 90°; blood pressure, 140/100; hgb, 60 per cent; red blood cells, 4,100,000; polymorphonuclears, 66 per cent; lymphocytes, 30 per cent; endothelial cells, 1; eosinophiles, 3; slight poikilocytosis. The other systems were negative.

The patient was admitted to hospital and a liver function test (bromosulphalein) was done—essentially negative. Her waist line on admission was 45 inches. On August 31st salyrgan 0.5 e.e. was given intravenously, which apparently reduced her waist measurement about 1 inch and her weight about 1½ lbs. This was repeated, but with no marked success. On September 5th, owing to great distension, a paracentesis was performed with the removal of 240 oz. of thin light brown fluid. No bile was apparent. Examination of fluid—no culture growth. Specific gravity, 1.018; no bile. On September 8th there was some red vaginal discharge. Her condition continued fair and she was up and around the ward, but the abdomen was enlarging.

**Operative procedure.**—On September 13th she was prepared for operation which was performed by one of us (J.O.B.) under ether anaesthesia on September 14, 1936. A mid-line lower abdominal incision was used, and on opening the peritoneum free bloody fluid gushed forth. The remainder was suctioned out slowly, revealing a mass in the left lower abdomen involving the left tube which was markedly enlarged, and the fimbriated end, very friable and looking like placental tissue, was found attached to the parietal peritoneum. The tube and some parietal peritoneum were removed. Both ovaries, the right tube, liver, gall bladder and stomach palpated but apparently normal. Two Penrose drains were inserted. Following the operation there was very free drainage for several days. The drains were removed on the seventh day. There was also some bladder irritation with dysuria which was relieved by argyrol instillations. The sutures were removed on the tenth day, when she was sent to the radiological department for deep

x-ray therapy. She was discharged on October 5th and instructed to report back.

*Pathological report.*—(By Dr. M. E. Hall, Pathologist, Royal Alexandra Hospital, Edmonton).

"Left tube and section of peritoneum—*adeno-carcinoma of the Fallopian tube, grade 3.*"

After discussing this with Dr. Floyd Keene, Professor of Gynaecology, University of Pennsylvania, it was decided to get her back for a complete hysterectomy. She was re-admitted on November 20, 1936, and some fluid could be detected in the abdomen which was somewhat distended.

*Report of second operation* (Dr. J. O. Baker).—Lower abdominal incision. Some free fluid present in the abdominal cavity; adhesions between intestines and uterus. The left broad ligament was very much thickened but no visible signs of carcinoma. The operation was difficult but total hysterectomy was performed. Her convalescence was satisfactory and she was discharged on December 9th after some more deep x-ray therapy.

*Pathological report.*—"The uterus was considerably enlarged, and the cervix prolonged. Embedded in wall of uterus near fundus are two small fibromyomata, one 2 cm. in diameter and the other 0.5 cm. The body of the uterus is firm and indurated. The mucosa is atrophic with a smooth, flat surface. The peritoneal surface of the uterus, especially fundus, is scarred and shows in places areas of chronic inflammatory reaction. Section of the right tube shows a chronic catarrhal and atrophic condition. Peritoneal surface similar to that of uterus. The ovaries are sclerotic and surrounded by adhesions and scar tissue. No areas of malignant infiltration found in the uterus, tubes, ovaries or peritoneum."

"Chronic metritis with sub-involution, multiple small fibromyomata. Chronic catarrhal salpingitis. Chronic sclerosis of ovaries. Chronic pelvic peritonitis, with scar."

The patient, although instructed to return, did not do so until February 16, 1937, when her condition was good and she was given more x-ray therapy. We heard from her by letter and when she appeared in the office on January 25, 1939, her condition was good. The abdomen and pelvis seemed clear and she had gained about 50 lbs. in weight. She returned next on July 21, 1937, when her condition was excellent and she had been working hard. Her haemoglobin was 74 per cent. We received a letter from her on April 11, 1940, in which she stated that she was feeling fine and would come in to see us later. On February 19, 1941, she came into the office for a check-over. Her condition was good. Hgb. 76 per cent. She feels good and is working hard outside on the farm, doing ordinary farm labour.

The points of interest in the above cases are:

1. Two cases to be added to the growing list of this rare condition—one apparently associated with tuberculosis of the tube.
2. The marked ascites of the one patient, which possibly is explained by the fimbriated end of the tube being attached to the parietal peritoneum.
3. Both patients are still living.

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## Clinical and Laboratory Notes

### DIRECT POSITIVE MICRO-FILM FOR THE REPRODUCTION OF RADIOGRAPHS

By P. H. MALCOLMSON

Edmonton

Since the advent of the direct positive film, it has been possible to make direct copies of x-ray films. The resultant films are superior to the usual lantern slide in that the intermediate process is dispensed with. In fact, occasionally the copy shows better detail than the original film.

The uses of this copying film are twofold: Firstly for making slides for papers or lectures and secondly, as has been advocated by Dr. C. Sutherland, for libraries.

A further use as suggested by Dr. Sutherland is this. We all have film storage problems. He suggests that old films that have positive findings be copied on this micro-film and the original films plus those with negative or unessential findings be sold. He has found that the money obtained by this sale would probably cover the cost of operations.

The equipment needed is comparatively simple and inexpensive and consists of:

1. Miniature camera (35 mm.). An expensive camera such as a Leica etc. is not required. We

use a Kodak 35, with a portrait lens and a filter. The filter allows more latitude in exposure time.

2. Film viewing box.
3. Projector. We use a Kodaslide projector.
4. Projecting screen. This must be fine grained in order that as little detail as possible is obliterated.
5. The film used is the direct positive as sold by Eastman, and is varnished to prevent scratching and finger marks.

Naturally, various focal distances for different size films must be used. These are:

14	x 17	26"	focus 10	stop 16
14	x 15	26"	" 10	" 16
11	x 14	20"	" 6	" 16
10	x 12	18"	" 4	" 16
8	x 10	13"	" 4	" 16
6½	x 8½	10"	" 4	" 16

In regard to exposure, a light meter plus a rheostat on the view box would be ideal for uniform results. However, in order to bring out more contrast from a dull original, a certain amount of personal judgment is essential.

Advantages over the glass lantern slide are several.

1. Cost. The cost of reproduction is less than half.

2. Detail is much better because of elimination of the intermediate process in the production of the glass slide.

3. Storage. Because of the small size and weight, storage and transportation are simple matters.

We have been making these reproductions for the past year, and as a result of trial and error, have become more and more satisfied with our results.

It is hardly necessary to add that colour photography with the 35 mm. camera is comparatively cheap and is extremely valuable in recording clinical cases and pathological specimens.

I am indebted to Mr. C. N. Godwin who has done all the technical work.

### VITAMIN A REQUIREMENTS

Preformed vitamin A occurs in fish liver-oils in at least two forms, linked as esters with various fatty acids; there are also at least four pro-vitamins (carotenes and cryptoxanthin) found in plants. The international unit is the activity of 0.6 micrograms of a standard sample of beta-carotene, the most active of the pro-vitamins and the most abundant. Biological assays make use of the rat, which can convert beta-carotene into vitamin A with about 50 per cent efficiency; But the larger mammals and man do not seem to handle carotenes so well. Thus Guilbert *et al.* (*J. Nutrition*, 1940, 19: 91) estimate the daily requirements of farm animals at 25 units of vitamin A, or 50 units of carotene, per kilogram of body weight; and Wagner (*Zeitschr. physiol. Chem.*, 1940, 264: 153) found that in adult volunteers fully depleted of vita-

min reserves the smallest daily doses which would slowly improve the symptoms were 2,500 units of vitamin A or 5,000 units of carotene. These quantities are probably less than the optimal daily intakes; the existence of this "double standard" of activity increases the difficulty of estimating the adequacy of a diet. Sub-clinical deficiency is often estimated by "dark-adaptation" tests, though vitamin A is certainly not the only factor affecting rod-vision. On the average, however, the time required to discern a dimly-lit signal, after exposure to glaring light under standard conditions, is prolonged in deficient persons. According to Hecht and Mandelbaum (*Am. J. Physiol.*, 1940, 130: 651) the difference between the normal and the deficient eye becomes greater and greater, the longer the time allowed for recovery from the effects of glare; tests in which the dim signal is perceived in a few seconds (*Pett, J. Lab. Clin. Med.*, 1939, 65: 149) would thus be relatively insensitive. Vitamin A in serum can be measured by the antimony-trichloride reaction; the normal amount seems to be about 1 unit per c.c., and values below 50 per cent of this are generally associated with deficient dark-adaptation (*Lindqvist, Klin. Wochenschr.*, 1937, 16: 1345; Josephs, Baber and Conn, *Bull. Johns Hopkins Hosp.*, 1941, 68: 375); serum carotene may also be low. A decrease in blood platelets and changes in the differential leucocyte count are also early symptoms of A deficiency, according to Wagner (*loc. cit.*) and Abbott, Ahmann and Overstreet (*Am. J. Physiol.*, 1939, 126: 254). Vitamin A is present in the urine only in pathological states.—From the *Bulletin of the Montreal Medico-Chirurgical Society*, Dec., 1941.

## Editorials

### THE NEED FOR MEDICAL OFFICERS BY THE DEFENCE SERVICES

**O**N Saturday, November 8th, the Canadian Medical Advisory Committee held a lengthy conference in Ottawa with Brigadier Gorrsline of the Army, Air Commodore Ryan of the Air Force, and Surgeon Commander McCallum of the Navy, to review the medical situation in respect to the Services. The discussion was frank and harmonious and undertook to deal with all phases of the medical aspects of Canada's part in this war. As of October 31st, 1941, 1,740 Canadian Doctors have enlisted in the several Services. This is approximately 17 per cent of the medical profession of Canada and represents 4.9 medical officers per 1,000 of an army personnel.

While the officers assured your Committee that they were reasonably satisfied with the progress that is being made in securing medical personnel, they realize that continuous efforts must be made to keep the services up to full strength. Therefore, it was agreed that the Divisional Advisory Committees of the Canadian Medical Association would again be reminded of their obligations in giving the Senior Medical Officers in their respective Districts the fullest measure of co-operation in securing medical enlistments. Furthermore, it was agreed that the Services would make, through our Association, a definite statement as to the present situation. We are glad to publish hereunder a statement over the signature of Brigadier

Gorssline, setting forth the situation as it now is:—

"Statements that have been published on the estimated number of medical officers required by the three Medical Services for the balance of the year have not been accepted by some members of the medical profession as indicating an urgent need for medical officers.

Many members of the medical profession have expressed their willingness to serve as a medical officer if and when there is an urgent need for such, but take the view that, as our Army Overseas is not engaged in active fighting, our Air Force casualties are looked after by existing Medical Services in Great Britain, and the number of casualties in our Navy is not large, there is no very urgent need for medical officers at the present time. They point to the fact that hospitals have been mobilized for service overseas and are still in Canada many months after mobilization.

This view would appear to be based on the opinion that the number of men in the Armed Forces requiring treatment for injuries due to active warfare is the chief factor in causing an urgent need for medical officers.

It would seem advisable to indicate that medical officers are required for purposes other

than the treatment of the sick from natural causes, or of active war casualties. Attention is called to the fact that, unlike the last war, much of the training of men for the Army and the Air Force is carried out in Canada, and the examination and re-examination of men, in addition to the treatment of sick personnel, require the services of a large number of medical officers, the majority of whom must have special training in one or other of the following branches of Medicine: Internal Medicine, including Psychological Medicine; Surgery, including Orthopaedic Surgery; Eye and Ear; Nose and Throat.

At the present moment an additional 100 young medical officers are immediately required, and also some older ones for replacement of the younger physicians proceeding overseas. It is probable that many more will be required in the future.

Any medical men interested in offering their services should get in touch with the District Medical Officer of the Military Headquarters of the District in which they reside or with the local representative of the Canadian Medical Association.

R. M. GORRSLINE,  
Brigadier,  
*Director General of Medical Services."*

## BOMBS AND BOMBING AS HEALTH AGENTS

WE do not usually associate any pleasant or helpful attributes with bombing. Rather the reverse. Death and Destruction are more in our minds. Yet the situation at present in Great Britain recalls to mind the old saw—"It's an ill wind that blows nobody good." For the position now is not unmitigatedly bad, and we are entitled to gather whatever crumbs of comfort and encouragement from the table that we can. More than one witness from the Old Land, some of them in official positions and in a position to speak with knowledge and authority, among them the Ministry of Health, assure us that the health of the British people is encouraging. This is not to say that there is no serious illness about, but what there is is found in scattered local areas and there are no widespread epidemics. The expected onslaught of influenza did not materialize, for example. The weekly health reports to be found in *The British Medical Journal* seem to bear this out. In drawing conclusions, these figures should be read with circumspection, otherwise false impressions can easily be reached. In England

and Wales several of the important notifiable diseases present during the summer have shown abatement lately. The incidence of acute anterior poliomyelitis in England and Wales during 1941 was low as compared with 1939 and 1940. Cerebrospinal fever, so common among troops in war time, is also well in hand.

Dire prediction had been made about the baleful influence on health of the crowded air-raid shelters, but the prophets of woe have, so far, fortunately proved to be wrong. The relative good health of the people is due, no doubt, to the excellent supervision of the shelters by the health authorities and those working with them. The sanitary arrangements are conducted under difficulties and, apparently, in many cases under the supervision of local authorities, with the aid of more or less volunteer workers. So far, we understand, the situation is not fully systematized, though efforts are being made to establish better order and more centralized jurisdiction. The defects of the efforts now being put forth, in so far as the incidence of communicable disease is concerned have

not resulted in an undue prevalence of the diseases that we would expect to find prevalent under conditions of overcrowding and mental stress. The ill-health attributable to these conditions of life apparently is counterbalanced by the destruction of crowded slum areas and the removal of their denizens to country refuges.

Much of this satisfactory condition, also, is due to the efficient and wide-spread reorganization of hospital service. Many of the large hospitals in London have been bombed and put out of commission. They have been replaced by a number of smaller institutions scattered widely about on the sector principle. These can give speedy aid. Incidentally, we are reminded that the hospitals of Britain are badly in need of instruments and appliances of all kinds. Unfortunately, too, they have an insufficient supply of doctors. Dr. Penfield, of Montreal, who was recently over on the other side, as the representative of the Associate Committee on Medical Research of the National Research Council of Canada, corroborates the impression that we have got as to the excellent state of health of the British population. Dr. Penfield stated, also, that there is less psychosis and hysteria among the civil population than in peace time. This, he thinks is due to the extraordinary reaction of the general population to the war situation. They can evidently "take it." Almost every one is doing a double job. There is no time to develop imaginary ailments. Despite rationing, there is no

indication at present of a lack of nutrition among the people. The favourable conclusion arrived at by Dr. Penfield is supported by other reliable observers, such as Professor Cathcart, of Glasgow University, Sir William Wilson Jameson, P.M.O., Ministry of Health, London. The opportunity created by bombing has been seized upon to create and administer efficient health measures, with which plans the Ministry of Health is deeply concerned.

Another factor which will eventually work out for good, if not immediately, is the rebuilding of the City along health lines. After the Great Fire of London in 1666, Sir Christopher Wren drew up a wise and comprehensive plan for the rebuilding of the City, but, owing to ignorance and apathy, and lack of support of a corrupt and bankrupt government his plans came to naught. Things are different now, and, despite shortage of funds, an effort is being made to rebuild the capital on economical and health lines. It is hoped that the new planning will not be left to the sweet caprices of local administration bodies but will be directed by a central reconstruction board composed of experts. A Ministry of Works and Buildings, constituted about a year ago has this matter in hand. Thus, it is expected that the destroyed and burned-out areas will not give place to similar slums and rookeries. A move towards this end had been begun in London even before the War. Bombs have made the situation more acute and more appealing.

A.G.N.

## TRAINING AND EFFICIENCY

**A**N interesting and important experiment in physical and economic rehabilitation has been described by Messrs. E. Jokl, Cluver, Goedvlok, and De Jongh.\* The experiment was started in 1933 with the idea of combating the deteriorating influence of unemployment and providing discipline and training for young men and boys. Over a period of 6 years, 1933 to 1939, more than 13,000 young men, of ages between 17 and 22, were trained in a special camp, where

they received both education and physical training. During this period 13,815 boys were attested to Special Service Battalions, and 10,735 completed the training course, of whom 9,409 were subsequently placed in employment.

The tremendous value of such education is too obvious for comment, even though there may be difficulty in arousing public opinion to the fact. But the point which is particularly stressed in this report is the results achieved by the physical training. Here, again, the advantages need not be stressed, but apparently there have not been

\* Training and Efficiency. E. Jokl et al. 188 pp., illust. South African Institute for Medical Research, Johannesburg, 1941.

many experiments on this scale in which the results both mental and physical have been so carefully followed up. The type of material is described as follows:

"They were free from infectious diseases or from other gross physical disabilities. At the time of their attestation to the course most of them were unable to find employment. They made a dull and undisciplined impression. Their posture was lax and their general bearing bad. Most of them came from poor farm homes, and one could safely assume that their nutrition had been unsatisfactory."

In other words these were the "unemployed", the painful, spreading ulcer of our civilization. What was done for them?

"At the camp they experienced for the first time in their lives a régime of strict discipline. They lived in well-kept tents and barracks; slept in proper beds; received a well-balanced diet; had to follow a carefully elaborated timetable, which set aside ample time for recreation. Last, but not least, they received three hours of physical training per day".

The report deals then in detail with the effects of training physically; on the height, chest girth, weight, and posture; vital capacity, pulse rate, and blood pressure, and performance increase during training. The physical improvement in most cases was definite and rapid. Weight increased, posture improved, respiratory capacity was increased and athletic performance was improved. These things one might expect,

but the authors lay special emphasis on the value of this physical improvement as leading to the other important changes in personality and mental capacities. In other words physical training indirectly is a most valuable form of education.

On the other hand it cannot be denied that a large number of individuals in a community will not seek, of their own initiative, ways and means to develop themselves. Consequently, the authors insist that the state should "introduce some system of compulsory training which would take charge of young citizens who are for any reason, unable or unwilling to carry their weight in the economic life of the community".

They further contend that the low physical standards found in a section of the South African population are largely due to environmental conditions rather than to basic biological defects, and as such can be corrected. The lessons to be learned from their work are impressive and encouraging. Every country finds a disconcerting proportion of unfit amongst its population when it begins to take stock. It is unfortunate that war seems to be the only means of forcing such stocktaking. At least however we can turn our necessity to good account by striving to raise the level of physical fitness by such methods of rehabilitation as have been described.

H.E.M.

## Editorial Comments

### Alcohol for Hospital Use

The addition of certain substances to rubbing alcohol, thus making it turbid on solution and somewhat oily to the touch, has been protested by a number of hospital administrators and staff doctors who find it unsatisfactory for instrument sterilization. There has been some lack of understanding also with respect to the purchase and restriction in use of ethyl alcohol which has not been denatured.

Specially denatured alcohol, known to doctors and nurses as "rubbing alcohol" and to the trade as S D A G - no. 1-F, now has the following formula :

97 gallons of ethyl alcohol (65 O.P.)  
2 gallons of castor oil  
1 gallon of Turkey red oil (neutral)  
500 grains of brucine sulphate  
500 grains of quassia  
2,800 grains of camphor

This compound is made available for *rubbing purposes only* and was never intended by the government, we are told, for any other purpose. When used to sterilize instruments or for other clinical purposes than as a rubbing fluid, it is really being so used in contravention of federal regulations. From some hospitals have come complaints that the present compound makes a turbid solution when diluted with water. But why dilute? Many hospitals dilute the rubbing alcohol apparently with the idea of making it go further, but, although the intent is to refresh the patient and to stimulate and protect the skin, the addition of water only lessens this effect and leaves the patient with cold, clammy skin and bedding after the alcohol has evaporated. If the rubbing alcohol be applied undiluted and in less copious handfuls, the desired effect can be readily obtained.

For the sterilization of scalpels, needles and other sharp instruments, untreated ethyl alcohol can now be used. Formerly hospital authorities were "between the devil and the deep blue sea", for the use of rubbing alcohol for this purpose was both unsatisfactory and illegal and ethyl alcohol could only be used "for medicinal purposes", meaning thereby the compounding of prescriptions and the manufacture of pharmaceutical preparations. Recently, however, when this unreasonable situation was brought to its attention, the Department of National Revenue, Excise Division, ruled that "it is the opinion of the Department that the term could be interpreted to include the use of ethyl alcohol for sterilizing in connection with surgical operations in hospitals".

When ethyl alcohol is purchased by a scientific or research laboratory for scientific purposes only, or by a bona fide public hospital certified to be such by the Department of Pensions and National Health, for medicinal purposes only, a drawback of 99 per cent of the duty paid may be granted under departmental regulations.

G.H.A.

#### Used Surgical Instruments for Britain

It is a well known fact that the Nazi bombers have taken a heavy toll of hospitals in the British Isles. It is of equal importance to recognize that, in the event of an invasion of Britain, the country cannot be too well equipped with medical and surgical supplies. In co-operation with the Red Cross Society, the Canadian Medical Association has undertaken to gather up, repair and ship to Britain all the equipment which we on this side of the water can spare. By letter, a personal invitation has been extended to every doctor in Canada to do his or her part. The response has been very gratifying but we are confident that there is an abundance of material which has not yet

been received. If you have not already acted in the matter will you please look over your surgical equipment now and see what you would like to give? If it is more convenient for you, take it along to the office of the Red Cross Unit in your area, and they will be glad to see that it is trans-shipped to the Red Cross headquarters where a medical committee will examine it and recommend any repairs that are necessary. The Red Cross will do the rest.

Our hard pressed brethren in Britain will be very much cheered when this equipment begins to roll in as further tangible evidence of our participation in this fight. Here is another opportunity for us to show our colleagues over there just how sincerely helpful we want to be.

#### Revue Canadienne de Biologie

A new Canadian scientific journal is always a notable venture; in these days it is also an indication of unusual courage. We therefore not only call attention to the latest publication of this kind, but wish to pay tribute to the spirit behind it. The *Revue Canadienne de Biologie*, whose first number appears this month, is published by the Université de Montréal, with the aid of a large committee containing many of the best known men on this continent, as well as in England and South America. The general secretary is M. Langier, Professor of physiology at the Université de Montréal. We are particularly impressed by the effort to make the journal truly bilingual. There are in this number three papers in English and four in French, and each paper contains a résumé of its contents in the alternative language.

We bespeak warm support of this venture, and shall watch its progress with great interest. It should afford a welcome medium for the publication of much work in the biological sciences. And it will also serve as another valuable meeting ground with our French confrères. H.E.M.

Our task, as we grow older in a rapidly advancing science, is to retain the capacity of joy in discoveries which correct older ideas and theories and to learn from our pupils as we teach them. That is the only sound prophylaxis against the dodo-disease of middle age.—Hans Zinsser in "As I remember Him", p. 105, Little, Brown and Company, Boston, 1940.

In the British Empire, we not only look out across the seas towards each other, but backwards to our own history, to Magna Charta, to Habeas Corpus, to the

Petition of Right to Trial by Jury, to the English Common Law, and to Parliamentary Democracy. These are the milestones and monuments that mark the path along which the British race has marched to leadership and freedom. And, over all this, uniting each Dominion with the other and uniting us all with our majestic past, is the golden circle of the Crown. What is within the circle? Not only the glory of an ancient, unconquered people, but the hope, the sure hope of a broadening life to hundreds of millions of men.—The King's Dominions, Churchill.

## Men and Books

WILLIAM HENRY WELCH

By E. P. SCARLETT

*Calgary*

It is impossible to read the life of William Welch\* without feeling that medicine has been supremely fortunate in its leaders. William Henry Welch is the symbolic figure of modern American medicine. Through his genius, his singlemindedness and his amazing energy, medicine on this continent in a space of less than fifty years came of age, gained a new spirit and direction and achieved a position of world leadership. He created a scientific aristocracy in medicine which destroyed the old narrow empiricism and allowed pure science to recreate medical methods. He made it possible for medicine again to assert its ancient claim as one of the learned professions by bringing it back into the university world and out of the control of groups of private medical practitioners. Hemmed in on one side by the plutocracy and on the other by a public following strange gods, he brought into being an active vital scholarship in medicine, in a field where scholarship had to contend with the forces of materialism and powerful Philistinism. With due regard to these things, the authors of this book have presented Welch within the framework of the story of the development of American medicine, and have indicated the fact in the title. The book is thus primarily a history rather than a biography.

In the main as writing goes, medical history and medical biography have not been particularly distinguished. This book sets a high standard for this type of work and must be included in the growing number of notable books in its field. It will appeal to three classes of readers. In the first group will be Hopkins men the world over who will approach the book in admiring mood, for none of them can think of Welch without respect, and very few without admiration and affection. The second class will include medical men of other schools who may here learn a great deal about the human fibre of their profession. And the other group of readers will be those who wish to know something of modern medical history in the making and the part which medicine has played in cultural development on this continent. They will be richly rewarded, for this is accurate well-written history.

Welch enjoyed the supreme gift of the gods—a life which was crowded with achievement, was never embittered and through a span of eighty-four years had all the balance and scope of a perfect drama, even down to the happy ending.

He did not languish in the prison-yard of the university executive or the laboratory worker. Rather he was one of the Olympians of this world, touching life at all points and enjoying in full measure its variety and sweeteness. He differed from the ordinary breed of medical men whose absorption in one pursuit makes their mental life monotonous. The whole sweep of his life is here—the New England heritage, the Yale period when he aspired to be a professor of Greek, the years as a young medical student in New York and later in Germany where his vision of a new medical order took shape, the subsequent founding of the first pathological laboratory in America, the opening of Johns Hopkins Medical School where he became one of the famous Big Four, the editing of America's first scientific medical journal, his part in the founding of the Rockefeller Institute for Medical Research, the organization of the model School of Hygiene, the World War years, and finally as the crowning achievement, at the age of seventy-six the founding of the Institute of the History of Medicine. There are some delicious bits in the story, such as the relations of the University Board and the faculty with the indomitable group of women who provided the endowment which made it possible for the Johns Hopkins Medical School to open its doors, and the way in which Welch, the bachelor-scientist was won over to co-education in medicine and even to woman suffrage. No less interesting are the accounts of Welch's teaching methods, the way in which he carried out his work and wrote his papers with something of the provoking delay and not a little of the opulent ease of genius, his success in handling millionaires and anti-vivisectionists and unruly politicians. Time and again when a job was to be done, Welch was the man called on to do it. He recalls those words which the Carthaginians wrote over the grave of Hannibal: "We vehemently desired him in the day of battle".

The figure of the man himself brings up nothing but the happiest thoughts. His unfailing sanity, even temper, good humour and tact were combined in unique fashion. In Osler's words, he had "a three storey intellect with an attic on top". Like Osler he possessed discipline without asceticism. He had the orderly mind of his New England ancestors but added to it a fine love of life in all its variety and a scholar's devotion to learning. The result was that rare type of man, a practical scholar. For like all great doctors he was a humanist first and last and in all things. For him there could be no antagonism between science and medicine, science and literature, or science and true religion. To his students for more than a generation he was known as "Popsy", a nickname which suited him perfectly and matched his rotund figure, the humorous twinkle in his eyes,

\* William Henry Welch and the Heroic Age of American Medicine. S. Flexner and J. T. Flexner. 539 pp. \$4.50. Macmillan, Toronto, 1941.

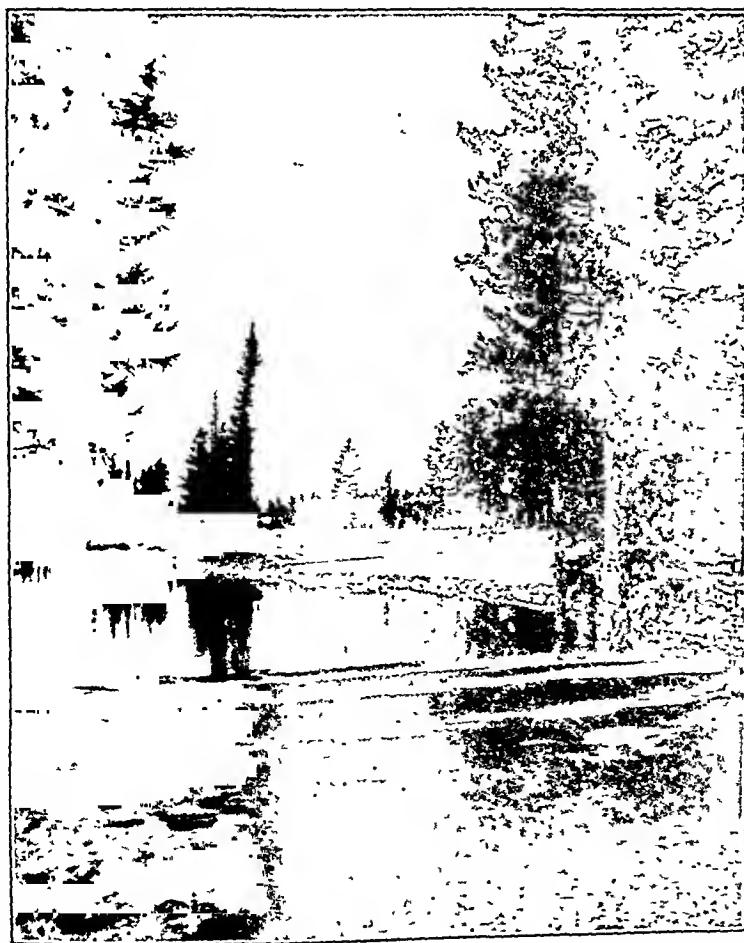
his inordinate love of cigars ("he would smoke anything that would burn"), and his many endearing habits. The name had the quality of affectionate intimacy, but no one was likely to use it carelessly, and one was not likely to forget that the word is a title of respect. It is in this connection that the personal recollections of the senior author of this book, the distinguished Dr. Simon Flexner, himself one of Welch's most brilliant students, will be treasured. For Welch was the rarest kind of man, who for all his preoccupation with a multitude of affairs still retained something of the eager spirit of Adam upon the first day.

That sort of fortune which attended Welch all his life finds for his biographers men who are perfectly competent, intelligent and sympathetic in comment. Something of the reticence of Welch himself enters into their handling of his work and their treatment of his character. The book lacks something of the charm and sympathy of Cushing's portrayal of Osler.

It is probably the nature of the task here undertaken, to tell the story of a man together with the medical history of his time, that enforces a rather severe and chastened style. There is very little brush work. The authors for the most part let the story of the man's activities mirror the man. But it is historical writing of a high order and the biographical lines are drawn with accuracy and an understanding sympathy.

It would be ungenerous to end this comment without expressing our pleasure to the authors for the admirable appendices and the thorough documenting of the text. For students there are long excerpts and complete summaries of some of Welch's more important addresses. Medical men will find in the book a fascinating panorama of the march of their profession. The general reader will gain a better understanding of the meaning of science. And all—medical and lay alike—will be deeply moved by the chronicle of a man who attained the almost perfect expression of his ideals.

## Association Notes



### Jasper Park Meeting June 15-19, 1942

Fourteenth Tee and Fairway, Jasper Park Lodge Golf Course. A championship course in every sense of the term—no two holes have the same length, no two the same character. Home of the famed Totem Pole Golf week, held annually the first week of September.



### A Scientific Section of Gastro-enterology

A petition signed by eighteen members of the Association has been received by the Executive Committee recommending that a Scientific Section of Gastro-enterology be established in the Association. This matter has been referred to the nine Divisions for information and expression of opinion. Members who may be interested in the establishment of such a Section are invited to make that fact known to the General Secretary.

## Medical Relief Fund for Great Britain

### Additional Subscriptions

We have to acknowledge the following additional contributions to this Fund: Quebec Division, \$245.00; Ontario Division (Victoria County Medical Society, Lindsay), \$75.00. Individual subscriptions from Nova Scotia amount to \$150.00 and from Saskatchewan, \$25.00.

We note that the sum of £4,500 has been sent to England from the medical profession of Australia in connection with this Fund.

## Hospital Service Department Notes

### Approved Schools for Laboratory Technologists

The Committee on Approval of Schools for Laboratory Technologists of the Canadian Medical Association has announced that the following hospital laboratories have been approved for the training of technicians, either in general or for special departments or for both certificates. The course, in each instance, is of one year's duration and more detailed information can be obtained by writing to the director of the laboratory or to the Department of Hospital Service of the Canadian Medical Association.

### VICTORIA GENERAL HOSPITAL, Halifax, N.S.

Ralph Smith, M.D., Provincial Pathologist.  
Courses: (a) General Certificate.

(b) Specialty—Bacteriology, Haematology, Pathological Chemistry and Histology.

(Instruction at Provincial Laboratory on work for V.S.H. and a group of Halifax and provincial hospitals.)

### SAINT JOHN GENERAL HOSPITAL, Saint John, N.B.

Arnold Branch, M.D., Director of Laboratories.  
Course: General Certificate.

### HOTEL DIEU DE MONTREAL.

Georges Baril, M.D., Director of Laboratory.  
Course: General Certificate.

### OTTAWA CIVIC HOSPITAL.

Max O. Klotz, M.D., Pathologist.  
Courses: (a) General Certificate.  
(b) Specialty—Biochemistry and Haematology.

### KINGSTON GENERAL HOSPITAL.

James Miller, M.D., Director of Laboratory.  
Courses: (a) General Certificate.  
(b) Specialty—Bacteriology, Histology, Biochemistry.

### ST. MICHAEL'S HOSPITAL, Toronto.

William Magner, M.D., Director of Laboratories.  
Courses: (a) General Certificate.  
(b) Specialty—Bacteriology, Biochemistry, Histology.

### TORONTO WESTERN HOSPITAL.

George Shanks, M.D., Director of Laboratories.  
Courses: (a) General Certificate.  
(b) Specialty—Bacteriology, Histology.

### HAMILTON GENERAL HOSPITAL.

William J. Deadman, M.B., Director of Laboratories.  
Course: General Certificate.

### MOUNTAIN SANATORIUM, Hamilton.

A. R. Armstrong, M.D., Director of Laboratories.  
Course: General Certificate.

## The War

### The First Canadian Division Medical Society

This Society has just completed its first year of life. The year ended in true Canadian style with a very successful dance in the beautiful estate occupied by one of our Field Ambulances in lovely Surrey. An anniversary dinner was held on October 18, 1941, in a typical English country inn.

Nine regular meetings were held during the year under the presidency of, first, Lt.-Col. H. M. Elder and later Col. E. A. McCusker. Speakers were invited from English University centres as well as from Canadian Military Hospitals and First Division Units. Among the outside medical men we heard most interesting papers from Col. Leonard Colebrook, Dr. J. Trueta, Capt. P. H. Linton, R.C.A.M.C., Professor Wallace H. Cole, of the American Hospital in Britain, Professor J. R. Ryle, of Cambridge University, and Col. J. R. Rees, Consulting Psychiatrist to the British Army.

From our own hospitals and Society we listened with pleasure to papers from Major I. M. Rabinowitch and Major C. A. R. Gordon on "Chemical warfare", and Col. W. Cone on "Brain abscess".

During the year several of our members have been promoted to commands, notably Lt.-Col. G. A. Sinclair, Lt.-Col. H. A. DesBrisay and

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

Lt.-Col. C. H. Playfair to Field Ambulances and Col. G. R. H. Farmer to 15th Canadian General Hospital. Our first President Lt.-Col. H. M. Elder returned to Canada in March to become A.D.M.S. Armoured Division and more recently Lt.-Col. G. Earle Wight has been given Command of No. 1 Canadian Convalescent Depot.

The First Canadian Division Medical Society benefited greatly by the gift through the kindness of Col. Nasmith of a large medical library during the year. Affiliation with the Canadian Medical Association was approved in November, 1940.

During the winter months of 1940-41 all medical officers of the First Canadian Division were given the opportunity of a month's refresher course in any of the Medical Centres of Great Britain. The good which was accomplished was proved in the reports which each member gave the Society on his return and the courtesy and help which was extended to us by the English and Scottish medical people was most gratifying.

The Society's second year began with the past meeting on October 14, 1941. The following officers were elected for the ensuing year: President—Lt.-Col. G. A. Sinclair; Vice-president—Lt.-Col. H. A. DesBrisay; Secretary-treasurer—Capt. D. W. Sparling; Chairman, Program Committee—Lt.-Col. C. H. Playfair.

Four short papers were read by members of the Society. Lt.-Col. DesBrisay presented a case illustrating the Arthus phenomenon recently seen in one of our main dressing stations. The second paper was a most interesting discussion by Major F. B. Bowman of the various common skin diseases seen in the Army.

Major C. E. Corrigan spoke on abdominal pains and the care necessary in making the diagnosis of appendicitis. He pointed out the high percentage of error in diagnosis as confirmed by pathological post-operative examination. Capt. J. P. Gilhooley then outlined some of the trials and troubles he has met during the last few months in his eye clinic.

The Society looks forward to an interesting winter if not in front line work certainly in our monthly meetings.

The annual dinner was a most happy and successful affair. Some 60 members were present. Lt.-Col. Sinclair occupied the head of the table and our guests included Major-Gen. G. E. Pearkes, V.C., D.S.O., M.C., Brig. Luton, D.M.S., Brig. Linton, D.D.M.S., the Brigadiers of the Division and representatives from Second and Third Canadian Divisions.

#### The Second Canadian Division Medical Society

The second meeting of the CII Medical Society was held in the Officers' Mess of the 11th Canadian Field Ambulance, on September 23, 1941.

On this occasion, the Society was privileged to have as speakers Lt.-Col. C. A.

McIntosh, R.C.A.M.C. and Lt.-Col. J. H. Palmer, R.C.A.M.C. Lt.-Col. McIntosh, in discussing the subject of "Chest wounds", referred first to the mortality and morbidity in this as compared with other wars. The altered respiratory function from open pneumothorax was explained, and the causes of hemothorax enumerated. The necessity of immediate measures to combat "sucking wounds" of the chest was emphasized and various methods that might be employed were cited. The possible results of other types of trauma to the chest were mentioned and the attitude of the surgeon toward the presence of foreign bodies within the lung or pleura was explained. Finally, the late morbidity was shown to result from infection, the treatment of which became the problem of the base hospitals.

Lt.-Col. Palmer gave a very complete discussion on the subject "Effort syndrome". The subject was taken up from the viewpoint of the Medical Officer in the Field, emphasis being placed on differential diagnosis. Tribute was paid to the very important research work on the subject being carried out at Mill Hill Hospital. Unit Medical Officers were encouraged to recognize the underlying psychiatric condition which can almost always be uncovered, and which in a large number of cases can be successfully treated by them.

A hearty vote of thanks was given the speakers and the meeting then adjourned.

(Sd.) T. M. BROWN, MAJOR, R.C.A.M.C.,  
Secretary-treasurer.

#### Questions About the War

The British Broadcasting Corporation has for some time been carrying a program entitled "Answering You", in which it deals with questions about Great Britain at war. At present this is re-broadcast by our C.B.C. at 10.30 a.m. E.D.S.T. on Saturdays. We are asked to say that the B.B.C. is anxious to receive more questions on this subject from Canadians. Questions from medical men interested in any particular point will be welcomed. The field covered by this program is extremely wide, judging by the suggested topics. These range through education in the army; social services; problems in restriction of silk stockings, cigarettes and beer; position of evacuees in Canada; all the way up to questions addressed directly to such personalities as Bernard Shaw and George Formby(!). The answering of the questions is done by prominent English authorities including cabinet ministers and such men as Wickham Steed, Vernon Bartlett, Harold Laiki and many other notables.

Questions may be sent to Box 500, C.B.C., Toronto, who will cable them to the B.B.C. It would be better to ask more than one question at a time on each subject, and some information about the question should also be supplied.

### Medical Equipment for Britain

The Committee appointed by the Canadian Medical Association to supervise this campaign wishes to make this following interim report.

The response from the doctors of Canada has far surpassed our expectations. From Victoria to Halifax there is not a single city, not a single town, and indeed scarcely a single village from which the local doctors have not poured in their contributions. The volume of valuable equipment received has almost swamped the Committee. It has been forced to appeal to the Central Registry of trained nurses in Toronto for help. Over a score of splendid nurses quickly responded.

All equipment received to date has been carefully examined, sorted and packed, pieces needing repairs have been sent to instrument houses, where they are being re-conditioned without profit to the Company. Much of the equipment was sent in perfect condition, indeed many pieces were absolutely new. All arrived in good shape.

The Red Cross has tried to make a personal acknowledgment to each doctor or hospital. Unfortunately a few cases were sent in with no donor's name attached. Will these donors please accept our thanks. The response has been splendid, but because parcels continue to arrive and many doctors may have overlooked this opportunity to do something personal to aid British hospitals—the Toronto Committee will continue to function.

EDWARD A. McCULLOCH,  
Chairman.

### Divisions of the Association

#### Association Médicale Canadienne, Division de Québec

(For English version see p. 82)

*Compte-rendu de la Quatrième Assemblée Annuelle de l'Association Médicale Canadienne, Division de Québec, tenue à l'Institut Neurologique de Montréal, le jeudi 9 octobre 1941, à 4.30 p.m.*

#### Discours du Président Sortant de Charge

Le Dr Léon Gérin-Lajoie s'adressa à l'Assemblée comme suit :

Il est d'usage pour le Président de l'Association Médicale Canadienne, en souhaitant la bienvenue à tous, eu cette assemblée annuelle, de rappeler dans ses grandes lignes les faits saillants de l'année écoulée et de jeter les jalons pour l'accomplissement d'œuvres fécondes par l'Exécutif que vous élirez dans quelques instants. Afin de n'avoir pas à me répéter, vous me permettrez d'élaborer mes remarques en langue anglaise convaincu que vous reconnaîtrez

dans ce geste l'estime et la reconnaissance que nous portons pour nos confrères qui nous ont honorés et ont mis en nous leur confiance, en nous élisant à la plus haute charge de l'Association.

Il appartient au secrétaire-honoraire, au trésorier-honoraire et aux présidents de comités de traiter devant vous en détails de nos activités. Mais en parcourant les minutes des six assemblées régulières de votre Comité Exécutif, il surgit à notre esprit des pensées de progrès en considérant le travail accompli et l'intérêt soutenu de chacun dans les affaires de l'Association.

Un nombre considérable de nouveaux membres est venu grossir les cadres de l'association, principalement au début de notre année fiscale; et l'intérêt déployé par un groupe imposant, désireux de se joindre à nous en bloc, la Fédération des Sociétés Médicales, doit être étudié attentivement et recevoir notre considération sympathique.

Notre Association sera véritablement représentative de la profession de la Province si la majorité de nos confrères se joignent à nous. Sûrement est-il possible de se rencontrer sur un terrain commun. Plus que jamais il est nécessaire pour chacun de sentir les coudes de son voisin. Dans une telle unité accomplirons-nous de grandes choses et maintiendrons-nous le standard élevé et l'efficacité qu'il est de notre devoir de maintenir.

Sir Willmott K. Lewis, s'adressant ces jours derniers aux membres du Canadian Club, appuya sur la nécessité de projeter des plans pour l'ordre nouveau dans la démocratie d'après guerre. La médecine jouera un rôle de premier plan, dans ce nouvel ordre, et les médecins seront appelés à pratiquer leur art dans une conception nouvelle, à adopter un système d'enseignement qui satisfera les exigences de l'heure, et de plus lourds fardeaux pèseront sur nos épaules.

L'Assurance-Maladie sera proposée comme solution possible de quelques uns des problèmes que notre profession sera appelée à envisager dans un avenir prochain. J'ai lieu de croire qu'un petit nombre seulement de praticiens ont étudié cette question, et ont lu les très intéressants articles publiés sur cette question par M. Hugh Wolfenden dans le *Canadian Medical Association Journal*. Afin de pouvoir parler avec autorité à nos représentants législatifs, il faut que nous soyons familiers avec les détails les plus subtils du fonctionnement d'un tel plan, davantage peut-être doit-on être au courant des besoins de la population et de la profession. Il est vrai qu'un certain nombre de Canadiens ne peuvent pas défrayer le coût de la maladie, et encore moins d'une hospitalisation. Il n'est pas du ressort de la profession médicale de supporter le choc de cette situation. La charité médicale est noble et doit être louangée et admirée, mais elle ne doit jamais être imposée. Les jours n'existent plus où la population était moindre et l'indigence exceptionnelle. La maladie est

devenue coûteuse, et pourtant l'on ne devrait pas songer à la médecine comme un luxe. Lorsqu'elle frappe à la porte elle doit être envisagée avec fermeté et supportée avec courage. Il est devenu une nécessité de se faire traiter, mais la charité médicale n'est pas le remède à une situation qui devient de plus en plus aiguë avec les progrès incessants de la science.

L'Association a joué et jouera encore une part importante dans l'aide qu'elle fournit au Gouvernement dans son effort de guerre. Elle a donné son entière co-opération aux différents Ministères de la Défense, de la Marine, de l'Armée et des Forces de l'Air. Il est de notre devoir de continuer ce travail et d'aider la cause pour laquelle notre Mère-Patrie, notre pays, et toutes les Démocraties luttent côte pour détruire et annihiler le Nazisme du monde.

Je suis convaincu que vous écoutez avec intérêt les différents rapports qui vous seront soumis pour approbation. Il vous fourniront une vue d'ensemble de nos activités.

Celles-ci ont été rendues possibles par chacun d'entre vous qui avez fait confiance à votre Association. Davantage peut-être aux efforts incessants et à la bonne volonté de vos officiers: le Dr H. R. Clouston, le président élu, les Drs. A. W. Young et E. S. Mills respectivement secrétaire honoraire et trésorier honoraire, le Dr Georges Hébert, le secrétaire adjoint, et les membres de l'Exécutif. Rien n'aurait pu être accompli s'ils n'avaient volontairement donné de leur temps, de leur expérience et de leur énergie: je tiens ici à leur en exprimer mes très sincères remerciements.

J'ai volontairement omis le nom du président de notre Exécutif le Dr F. S. Patch dont le travail soutenu et la pensée constante à la cause de l'Association Médicale Canadienne méritent plus qu'une simple mention. Il se retire de la présidence de notre Exécutif, mais son exemple servira longtemps à ceux qui seront à la gouverne de nos destinées; son habileté à résumer une discussion, son jugement sûr dans les situations difficiles, son dévouement sincère à l'intérêt de tous et chacun resteront longtemps dans la mémoire de ceux qui auront été assez fortunés pour travailler avec lui. C'est avec regret, et j'ai l'impression d'exprimer ici les vues non seulement des membres de l'Exécutif, mais aussi celles de tous les membres de l'Association, que nous avons été dans l'obligation d'accepter sa démission et que nous n'avons pas pu le garder plus longtemps avec nous, à la tête de notre Exécutif.

#### Le Rapport du Secrétaire Honoraire

*Le Rapport du Secrétaire Honoraire a été adopté avec les amendements suivants:*

Que les noms des membres qui ont été lus par la Division de Québec pour agir par procuration sur le Conseil Général de l'Association Médicale Canadienne, soient ajoutés à la liste des représentants contenus dans ce rapport.

A son assemblée du 11 février 1941 le Dr Georges Hébert a été élu secrétaire adjoint pour la balance de l'année, et il fut un assistant régulier aux assemblées de l'Exécutif depuis cette date.

Les devoirs d'ordre militaire ont amené la démission du Dr W. S. Rodger de Cowansville, comme membre du Comité Exécutif en juin 1941. Cette démission a été acceptée avec regret. Il a été décidé de maintenir cette vacance jusqu'à l'élection de notre Exécutif à son assemblée annuelle.

D'autres démissions furent aussi reçues au cours de l'année de Présidents de Comités: le Dr A. T. Bazin, président du comité du cancer, et le Dr I. M. Rabinowitch, président du comité de nutrition. La division de Québec a été heureuse d'obtenir l'aide des Drs C. B. Peirce et L. H. Gariépy pour cette charge sur ces deux comités.

Une autre nomination a été faite par votre Exécutif, celle du Dr Jean Saucier, comme représentant de la Division de Québec sur le Bureau de Rédaction du *Canadian Medical Association Journal* pour l'année 1941. Cette nomination a été acceptée unanimement par le Bureau de Rédaction. Depuis la nomination du Dr Saucier le *Journal* a publié des extraits de certains articles, en français, de même qu'un certain nombre de nouvelles concernant la profession médicale de la Province de Québec. La division de Québec espère que le nombre de membres canadiens-français augmentera dans l'Association et qu'il sera possible d'étendre cette initiative du *Journal*.

#### Assemblée annuelle de l'Association Médicale Canadienne

Certains membres ont été élus pour représenter la Division de Québec sur le Conseil Général de l'Association Médicale Canadienne à sa 72e assemblée annuelle tenue à Winnipeg en juin 1941.

Le Dr W. W. Lynch a été élu pour représenter la Division sur le Comité des Nominations de l'Association Médicale Canadienne à cette même réunion.

L'Association Médicale Canadienne a élu les membres suivants de la Division de Québec sur le Comité Exécutif de l'Association pour l'année 1941-42: Drs F. S. Patch, Léon Gérin-Lajoie, et W. H. Delaney. Membres Ex officio sur le Comité Exécutif et venant de la Province de Québec les Drs A. G. Nicholls, rédacteur en chef du *C.M.A. Journal* et D. S. Lewis, trésorier honoraire de l'association.

#### Membres

Le 15 septembre 1940, au 15 septembre 1941, 99 nouveaux membres sont venus s'ajouter à notre liste, le chiffre total indiquant une augmentation nette de 69 sur l'an dernier. Au 15 septembre 1941 la Division de Québec avait 701 membres actifs et huit membres vitaux soit un total de 709.

Actuellement 72 membres de la Division de Québec sont en service actif avec la Marine, l'Armée, ou les Forces de l'Air. Il a été décidé par l'Association Médicale Canadienne en octobre 1940 que les membres enrôlés dans les services militaires, servant plein temps, et ne faisant aucune clientèle privée, seront exempts des paiements de la cotisation annuelle pour l'année 1941, mais que le *Journal* ne sera pas adressé à ces membres. Cette réglementation a été dans la suite modifiée en mars 1941, quand il a été décidé d'accorder le *Journal* à ces membres qui en feront la demande au coût, de \$4.00 par année.

La question de l'augmentation des membres a reçu une attention particulière au cours de l'année. En co-opération avec les autres Divisions de l'Association Médicale Canadienne, la Division de Québec a organisé une campagne de recrutement à la fin de 1940. Une lettre circulaire a été adressée à environ 400 médecins de langue anglaise et 2,100 médecins de langue française de la Province de Québec. A titre gracieux et pour rendre service à la profession médicale un mémoire contenant les renseignements sur l'exemption de l'impôt sur le revenu pour la profession médicale, a été inclus dans chaque lettre. En raison de cet effort 79 nouveaux membres se sont joints à l'Association Médicale Canadienne. Bien que cette réponse ne puisse pas être considérée comme excellente, il faut se souvenir que la Division a pratiquement doublé le nombre de ses membres depuis son organisation en 1937. Il reste beaucoup à faire encore cependant, et la Division de Québec continuera à profiter de l'occasion pour apporter à ceux qui ne sont pas membres les avantages qu'ils peuvent retirer de l'Association Médicale Nationale.

#### Comité des Cours de Perfectionnement

Les cours de perfectionnement organisés par la Division de Québec, ont été poussés à la limite des moyens financiers à la disposition de la Division, et votre Exécutif profite de la circonstance pour rendre hommage à l'excellent travail de ce Comité.

#### Société Canadienne de la Croix-Rouge

Depuis quelque temps notre Président le Dr Léon Gérin-Lajoie est Président du Comité spécial organisé dans le but de co-opérer avec la Société Canadienne de la Croix-Rouge. Les Drs A. T. Bazin, Edmond Dubé, et F. G. Pedley font partie de ce Comité. Sur la recommandation du Col. W. Leggat, Président de la Division Provinciale de Québec de la Société Canadienne de la Croix-Rouge, le Dr Léon Gérin-Lajoie et les membres de son Comité ont été réélus par la Division de Québec de l'Association Médicale Canadienne pour servir à titre d'Aviseurs sur un nouveau Comité, connu sous le nom de Comité des Services de Santé Publique de la Croix-Rouge.

La Division de Québec est également représentée sur le Comité Aviseur des Désastres de la Croix-Rouge, par les Drs A. T. Bazin, et Léon Gérin-Lajoie.

#### La Guerre

Votre Exécutif a porté un intérêt particulier sur les soins médicaux accordés aux réfugiés de guerre, et le Dr E. S. Mills a représenté la Division de Québec sur le Conseil Canadien des Enfants venus d'outre-mer.

A la demande de l'Association Médicale Canadienne un effort a été tenté dans les premiers mois de l'année 1941 pour obtenir des médecins pour le Royal Army Medical Corps d'Angleterre. A cause des difficultés dans les questions d'échange monétaire, aucun succès pratique ne fut obtenu. Les plus récentes données fournies par l'Association montrent que des 397 enrôlements de médecins canadiens du 1<sup>er</sup> mai 1941 au 31 août 1941, 46 de ce nombre ont été transférés au R.A.M.C.

Il a été demandé à la Division de Québec de constituer deux bureaux médicaux de revision pour les recrues d'âge militaire, un pour le district de Montréal, un pour le district de Québec. Le choix du personnel a été le suivant:

*Montreal:* Les Drs C. R. Bourne, L. H. Gariépy, L. de G. Joubert, J. G. Lefebvre, Jean Mignault, E. J. Mullally.

*Québec:* Les Drs W. H. Delaney, J. B. Jobin, Achille Paquet, René Turcot, Joseph Vaillancourt, C. Vézina.

Les autorités militaires de la Province ont consulté le Comité Aviseur de la Division de Québec, en quête de renseignements sur la disponibilité et la compétence de médecins qui offraient leurs services, dans l'Armée, dans la Marine et dans l'Aviation. Il est évident qu'une continue co-opération avec l'Association Médicale Canadienne se poursuivra en vue du besoin urgent de personnel médical dans les différents services militaires.

La British Medical Association a récemment établi un fond de secours de guerre (War Benevolent Fund) pour venir en aide aux membres de la profession médicale anglaise, qui ont souffert de la perte de leurs maisons et de leurs propriétés par des raids aériens. Un objectif de \$250,000 a été projeté et déjà \$150,000 ont été collectés en Angleterre. Convaincue qu'un grand nombre de médecins canadiens seront heureux de souscrire à ce Fond, l'Association Médicale Canadienne accepte la contribution individuelle des membres de la profession, pour être distribuée à la discrétion de la British Medical Association. L'Association Médicale Canadienne a reçu l'autorisation nécessaire pour procéder à la collection des fonds pour cette œuvre qui a été enregistrée au Ministère des Services Nationaux de Guerre sous l'Acte des Charités de guerre.

Le Comité Exécutif désire à nouveau attirer l'attention des membres sur ce Fond de Se-

Fédération des Sociétés Médicales, should be carefully studied and receive sympathetic consideration. Our Association will be representative of the profession of this Province if and when the majority of our confrères join our ranks. Surely there is a possibility of meeting on common ground. More than ever has it become a necessity for each one of us to feel the elbows of the others. In such unity shall we achieve great things and maintain the high standard and efficiency which it is our obligation to uphold.

Sir Willmott K. Lewis, in speaking before the members of the Canadian Club a few days ago, stressed the necessity of formulating plans for the new order of post-war democracy. Medicine will play a foremost part in this new order, and physicians will be called upon to apply new forms of practice, a system of teaching adaptable to the exigencies of the day, and heavier burdens will rest upon our shoulders.

Health insurance will be proposed as a possible solution to some of the problems our profession will have to face in the near future. I believe that but a handful of practitioners have studied this question and read the most interesting articles published in the *Canadian Medical Association Journal* by Mr. Hugh Wolfenden on this subject. In order to speak authoritatively to our legislative representatives who are liable to promulgate such legislation, we must be conversant with the minute details of the working of such a plan, and more so must we be familiar with the needs of the public and of the profession. True, there are a number of Canadians who cannot afford the expenses brought about by sickness, and much less by hospitalization. It is not the responsibility of the medical profession to bear the brunt of this situation. Medical charity is noble and to be praised and admired, but it must never be compelled. The days have passed when the population was small and indigence scarce. Sickness has become costly, and yet one should not think of medicine as a luxury. When it knocks at the door it must be faced and borne with courage: it has become a necessity to be treated, but medical charity is not the remedy to a situation which is becoming always more acute with the incessant progress of science.

The Association has played and is playing a great part in helping the Government in its war effort. It has given its whole-hearted co-operation to the different Ministries of Defence, the Navy, the Army and the Air Force. It is our duty to carry on this work and to help the cause for which our Motherland, our Country and all the democracies are today fighting side by side in order to destroy and annihilate Nazism from this world.

I am convinced that you will listen with interest to the different reports which will be submitted to you for approval. It will furnish you with a bird's eye view of our activities. These have been made possible by everyone of you who have put your faith in our Association. More so, perhaps, to the untiring efforts and good-will of your officers: Dr. H. R. Clouston, the president-elect, Drs. A. W. Young and E. S. Mills, respectively honorary secretary and honorary treasurer, Dr. Georges Hébert, associate secretary, and the members of the Executive. Nothing could have been achieved had they not willingly given their time, their experience and their energy. I wish here to express to them my sincere thanks.

I have voluntarily omitted the name of our chairman of the Executive, Dr. F. S. Patch, whose continuous work and constant thought in the cause of the Canadian Medical Association merit more than a simple mention. He is retiring from the Chairmanship of our Executive, but his example will serve for many years to those at the helm of our destinies; his ability to summarize a discussion, his keen judgment in difficult situations, his sincere devotion to the interests of one and all, will long be remembered by those who have been fortunate enough to have worked with him. It is with regret, and I feel I am expressing the views of not only the members of the Executive but also the views of all the members of the Association, that we had to accept his resignation, and that we could not keep him longer as the head of our Executive.

### Report of the Honorary Secretary

This report was adopted, with the following amendment: "That the names of members appointed by the Quebec Division to act as alternates on the General Council of the Canadian Medical Association should be added to the list of representatives contained in the report."

At its meeting on February 11, 1941, Dr. G. Hébert was appointed associate secretary for the balance of the year.

Military duties caused the resignation of Dr. W. S. Rodger, Cowansville, from the Executive Committee in June, 1941. The vacancy has been left unfilled until the election of the new Executive at the annual meeting.

Resignations were also received during the year from the chairmen of two special committees: Dr. A. T. Bazin, chairman of the Committee on Cancer, and Dr. I. M. Rabino-witch, chairman of the Committee on Nutrition. Drs. C. B. Peirec and L. H. Gariépy carried on the work of these two committees.

Your Executive also appointed Dr. J. Saucier as representative of the Quebec Division on the Editorial Board of the *C.M.A.J.* for 1941. This nomination was unanimously accepted by the Board. Dr. Saucier provides the *Journal* with French abstracts of selected articles as well as news concerning the profession of our Province. The Quebec Division hopes that as the membership of French speaking physicians increases this feature in the *Journal* will be expanded.

**Appointments to the Canadian Medical Association.**—Appointments to General Council and Nominating Committee of the Canadian Medical Association were duly made.

The Canadian Medical Association appointed the following members of the Quebec Division to the Canadian Medical Association Executive Committee for the year 1941-42. Drs. F. S. Patch, L. Gérin-Lajoie and W. H. Delaney.

**Membership.**—From September 15, 1940, to September 15, 1941, 99 new members were added to our list; a net increase of 69 over last year. Membership in the Quebec Division at September 15, 1941, stood at 701 active and 8 senior members; a total of 709.

At the present time 72 members of the Quebec Division are on full time service with the Army, Navy or Air Force. It was ruled by the C.M.A. in October, 1940, that members engaged in such full time service, and not engaged in any private practice, should be exempted from the payment of fees for 1941, but that the *Journal* should not be sent to members so carried. This ruling was modified in March, 1941, when it was decided to supply the *Journal* on request at \$1.00 per year.

The question of increasing membership was given a great deal of consideration during the year. In co-operation with other Divisions of

Je suis assuré que si les institutions de langue française le désirent, les administrateurs autoriseront immédiatement l'impression de ces formules sur réception de la traduction du texte.

Les dossiers en usage dans les différents hôpitaux de premier ordre sont assez divers. Qu'il soit mieux de les ramener tous à un même type est une question à discuter. L'opinion individuelle jusqu'ici ne semble pas favorable à ce qu'on rapporte tous ces cas au bureau central de Toronto.

Un hôpital de première importance a fait du cancer une maladie à déclarer, dans la mesure du possible. Il semble que ce soit là un progrès.

Les conférences et cliniques dans les hôpitaux sur les tumeurs, néoplasmes, ou, cancers, seront peut-être de pratique difficile le personnel civil étant limité dans le moment, mais on devrait les encourager.

Il est recommandé que plus d'attention soit donnée à l'éducation de la profession médicale qu'à celle des profanes. La conduite et le soin d'un patient cancéreux devraient être un effort de groupe où chaque membre de la profession médicale peut jouer un rôle important. Mais ceci peut réussir seulement si tous collaborent individuellement et collectivement afin d'apprécier à leur juste valeur ce que les différents moyens à leur disposition peuvent pour le patient, ou pour le contrôle du néoplasme, ou comme palliatif des symptômes, et ensuite agir au meilleur de leur connaissance pour décider ce qui donne au patient une santé relative pour le temps le plus long.

Sur une motion du docteur Peirce, secondée par le docteur H.-B. Church, le rapport du Comité sur le Cancer fut adopté.

Il fut proposé, secondé et accepté que le Comité Central de l'Association Médicale Canadienne sur le cancer devrait s'occuper de la recommandation du docteur Peirce à propos de l'éducation de la profession médicale dans la conduite et le soin du patient cancéreux.

#### Comité des Cours de Perfectionnement

Le docteur W.-J. McNally, président du Comité des cours de perfectionnement, lut le rapport suivant:

Il y eut huit réunions durant la dernière année. Votre comité a organisé son travail avec l'aide des représentants des districts du Conseil. Nous remercions ces messieurs pour leur co-opération à organiser des réunions dans leurs districts. Un effort spécial a été fait cette année afin d'organiser des assemblées dans les districts avoisinant Québec, mais jusqu'ici les docteurs Rousseau, Delaney et Gariépy n'ont pas eu de succès. Comme résultat de notre expérience acquise au cours de l'année, il a été décidé de limiter le nombre des conférenciers pour une réunion. Ceci a un double avantage: plus de temps pour la discussion et un coût moindre pour le déplacement des conférenciers.

Les frais de voyage pour ces réunions se chiffrent à \$128.42 et ont été payés par la Division de Québec.

Les réunions ont été appréciées et bien encouragées. Dans chaque cas le groupe local a accordé aux conférenciers toute la courtoisie voulue.

#### Le Président-élu

Le Président informe ensuite l'Assemblée de l'élection du docteur H.-R. Clouston comme Président-élu à l'Assemblée annuelle, tenue le 10 octobre, 1940.

#### L'Officiers et Comité Exécutif

Les officiers suivants ont été élus:

Président-élu—Docteur C. Vézina, Québec.

Président du Comité Exécutif—Docteur D.-S. Lewis, Montréal.

Président sortant de charge—

Docteur L. Gérin-Lajoie, Montréal.

Secrétaire honoraire—Docteur A.-W. Young, Montréal.

Secrétaire adjoint—Docteur Georges Hébert, Montréal.

Trésorier honoraire—Docteur E.-S. Mills, Montréal.

District de Montréal—

Docteur L.-H. Gariépy, Montréal,

Docteur C.-K.-P. Henry, Montréal,

Docteur W. de M. Srivier, Montréal.

District de Bedford—Docteur G.-F.-L. Fuller, Cowansville.

District de Huntingdon—Docteur M.-R. Stalker, Ormskown.

District de Hull—Docteur H.-B. Church, Aylmer.

District de Québec—Docteur W.-H. Delaney, Québec.

District de St-Maurice—Docteur J.-M.-F. Malone, Trois-Rivières.

District de Sherbrooke—Docteur J.-B. Winder, Lennoxville.

#### Canadian Medical Association, Quebec Division

The following is an account in abstract of the Fourth Annual Meeting of the Canadian Medical Association, Quebec Division, held at the Montreal Neurological Institute, October 9, 1941, at 4.30 p.m.

#### Retiring President's Address

Dr. Léon Gérin-Lajoie addressed the meeting as follows:—

Il est d'usage pour le Président de l'Association Médicale Canadienne, en souhaitant la bienvenue à tous, en cette assemblée annuelle, de rappeler dans ses grandes lignes les faits saillants de l'année écoulée et de jeter les jalons pour l'accomplissement d'œuvres fécondes par l'Exécutif que vous élirez dans quelques instants. Afin de ne pas à me répéter, vous me permettrez d'évoquer mes remarques en langue anglaise convaincu que vous reconnaîtrez dans ce geste l'estime et la reconnaissance que nous portons pour nos confrères qui nous ont honorés et ont mis en nous leur confiance, en nous élisant à la plus haute charge de l'Association.

To the honorary secretary, honorary treasurer and chairmen of committees, fall the duties of delving into the details of our activities. But in perusing through the minutes of the six regular meetings of your Executive Committee, interesting thoughts surge through our minds in considering the work done and the continued interest of every one in the affairs of the Association.

Membership has increased notably, especially at the beginning of our fiscal year, and the interest displayed by an important group who wish to join en bloc, La

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Sir Willmott K. Lewis, in speaking before the members of the Canadian Club a few days ago, stressed the necessity of formulating plans for the new order of post-war democracy. Medicine will play a foremost part in this new order, and physicians will be called upon to apply new forms of practice, a system of teaching adaptable to the exigencies of the day, and heavier burdens will rest upon our shoulders.

Health insurance will be proposed as a possible solution to some of the problems our profession will have to face in the near future. I believe that but a handful of practitioners have studied this question and read the most interesting articles published in the *Canadian Medical Association Journal* by Mr. Hugh Wolfenden on this subject. In order to speak authoritatively to our legislative representatives who are liable to promulgate such legislation, we must be conversant with the minute details of the working of such a plan, and more so must we be familiar with the needs of the public and of the profession. True, there are a number of Canadians who cannot afford the expenses brought about by sickness, and much less by hospitalization. It is not the responsibility of the medical profession to bear the brunt of this situation. Medical charity is noble and to be praised and admired, but it must never be compelled. The days have passed when the population was small and indigence scarce. Sickness has become costly, and yet one should not think of medicine as a luxury. When it knocks at the door it must be faced and borne with courage: it has become a necessity to be treated, but medical charity is not the remedy to a situation which is becoming always more acute with the incessant progress of science.

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I am convinced that you will listen with interest to the different reports which will be submitted to you for approval. It will furnish you with a bird's eye view of our activities. These have been made possible by everyone of you who have put your faith in our Association. More so, perhaps, to the untiring efforts and good-will of your officers: Dr. H. R. Clouston, the president-elect, Drs. A. W. Young and E. S. Mills, respectively honorary secretary and honorary treasurer, Dr. Georges Hébert, associate secretary, and the members of the Executive. Nothing could have been achieved had they not willingly given their time, their experience and their energy: I wish here to express to them my sincere thanks.

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At the present time 72 members of the Quebec Division are on full time service with the Army, Navy or Air Force. It was ruled by the C.M.A. in October, 1940, that members engaged in such full time service, and not engaged in any private practice, should be exempted from the payment of fees for 1941, but that the *Journal* should not be sent to members so carried. This ruling was modified in March, 1941, when it was decided to supply the *Journal* on request at \$4.00 per year.

The question of increasing membership was given a great deal of consideration during the year. In co-operation with other Divisions of

the C.M.A. the Quebec Division conducted a membership campaign at the end of 1940. A circular letter was mailed to approximately 400 English and 2,100 French doctors in our Province. Information on income tax exemptions granted to the profession was enclosed with each letter. As a result 79 new members were gained for the C.M.A. While this response cannot be called good, it must be remembered that the Division has practically doubled its membership since its organization in 1937. Much remains to be done, however, and the Division will take every opportunity of bringing home to non-members the advantages of membership in their national medical association.

**Post-graduate Education.**—The post-graduate educational campaign has been fostered to the utmost within the limits of the Division's income, and your Executive welcomes this opportunity of paying tribute to the excellent work of the Committee.

**Canadian Red Cross Society.**—Our President has acted as chairman of a special committee formed to co-operate with the Red Cross Society. Drs. A. T. Bazin, F. G. Pedley and E. Dubé have acted as members. At the suggestion of Col. W. Leggat, President of the Red Cross Society, Quebec Provincial Division, this Committee was re-appointed by the Quebec Division to serve as an Advisory Board to a newly formed Red Cross Public Health Services Committee. The Division is also represented on the Red Cross Provincial Advisory Emergency Committee by Drs. Bazin and Gérin-Lajoie.

**The War.**—Considerable interest has been taken by your Executive in the matter of the medical care of war guests, and Dr. E. S. Mills has represented the Quebec Division on the Council for Overseas Children.

At the request of the C.M.A., an attempt was made early in 1941 to obtain doctors for the Royal Army Medical Corps. Owing to difficulties in currency exchange this met with poor success. Recent figures supplied by the Association show there were 397 medical enlistments of Canadian doctors from May to August 31, 1941. Of this number 46 were seconded to the R.A.M.C.

The Quebec Division was asked to select two medical boards to re-examine trainees, one each for the Montreal and Quebec districts. The following were nominated:

Montreal: Drs. E. J. Mullally, J. G. Lefebvre, J. Mignault, L. de G. Jonbert, L. H. Gariépy and C. R. Bourne.

Quebec: Drs. C. Vézina, A. Paquet, J. Vaillancourt, R. Tureot, W. H. Delaney and J. B. Jobin.

Military authorities in the Province have consulted the Quebec Division's Advisory Committee as to suitability and availability of physicians who have offered their services to

the three Forces. Further co-operation with the C.M.A. is anticipated in view of the urgent need for medical personnel in the services.

The British Medical Association has recently established a War Benevolent Fund to aid members of the profession who have suffered loss of home and property in air raids. \$250,000 has been set as a first objective, and already \$150,000 has been raised in Britain. Believing that many doctors in Canada would be glad to subscribe, the C.M.A. is accepting contributions which will be distributed at the discretion of the British Medical Association. The C.M.A. has received the necessary authority and the Fund has been registered under the War Charities Act.

The Executive Committee wishes once more to draw the Fund to the attention of the members. There can be no doubt that all the financial assistance will be highly appreciated.

#### Committee on Economics

The chairman, Dr. R. Vance Ward, reported as follows:

The principal activity of your committee during the past year has been the compilation of data on the organizations which furnish medical service to their members in the Province of Quebec. The study included the so-called "Friendly Societies" and the industrial medical services in the province. Copies of the reports sent to the General Secretary of the C.M.A., are in the files of the Quebec Division.

Your chairman has also acted as a member of the Committee on Industrial Hygiene of the C.M.A., under the chairmanship of Dr. J. S. Cunningham. The efforts of this committee have been toward the establishment of adequate medical services in war industry.

#### Committee on Legislation

The chairman, Dr. W. H. Delaney, reported that:

The Chiropractors' Bill, seeking legal status for its group of irregular practitioners, was brought before the Private Bills Committee. The Bill was rejected. It is timely to remark that the medical profession at large in our province, numbering in the neighbourhood of 3,000, have been indifferent about their legal rights. It would seem opportune for the medical profession in this province to combine forces and exert sufficient influence on the members of the Quebec Legislature to eliminate the chiropractic danger, and it is recommended that organized medical bodies of this province should look into the matter of arranging such defence.

Your chairman was further requested to assist the College of Physicians and Surgeons in obtaining the amendments to their Charter contained in a Bill before the House for adoption. An amendment was inserted into this Bill which, if passed, would have annulled the whole principle of the Medical Act. Permission to with-

draw the Bill was requested, and was granted by the Government.

The attention of this Division is drawn to the fact that the College of Physicians and Surgeons never submitted to the Division, nor to myself, copies of the proposed amendments, and therefore this Division had no knowledge of what was contained in the Bill which they were asked to support.

It is therefore in order to suggest that in the event of further co-operation being requested from this Division by the College of Physicians and Surgeons, this latter body be asked to submit their proposed Bill of amendments for our consideration. There may have been clauses in the proposed amendments that should have received serious consideration by this Division.

### **Committee on Public Health**

The report of the Committee on Public Health, by Dr. F. G. Pedley, after some general remarks, went on to say:

It is gratifying to note that long looked for venereal disease legislation was finally enacted in March, 1941. The Bill requires physicians to report all cases of venereal disease to the Director of the Venereal Disease Branch of the Provincial Department of Health and Social Welfare. Cases in the first instance are to be reported by number and only by name if treatment is refused or neglected. The Bill also gives authority to the Director to examine suspected persons and to require their treatment if found infected.

Your chairman, as a member of the Committee on Public Health of the C.M.A., recommended the following for the consideration of the Association as a whole: (1) the development of a national program for venereal disease control; (2) a consideration of the public health aspects of housing with particular reference to post-war activities; (3) the routine testing of recruits for the Canadian Army with the Wassermann test; (4) a consideration of the policy of the Canadian Broadcasting Commission in regard to the advertising of proprietary medicines.

### **Committee on Cancer**

The chairman, Dr. C. B. Peirce, in his report said:

The activities during the past year have been devoted chiefly to informal discussions with and enquiries of members of the staffs of several of the major hospitals of the Province as to methods and means used in these institutions for the study of and correlation of data on cancer patients.

One visit has been made to the headquarters of the Association in Toronto for the purpose of discussing the preparation of the standard cancer report form of the C.M.A. in French. I am assured that if there is a desire for this on

the part of the French-speaking institutions, the Administrative officers will immediately authorize the printing of such upon receipt of a translated text.

The types of records used by the several major hospitals are quite diverse. Whether or not standardization is desirable is open to debate. Individual opinion so far as sampled is not favourable toward central reporting of these cases to the Toronto office.

One major hospital this year has made cancer a "reportable" disease within its own confines. This is believed to be a step forward.

The maintenance of tumour, neoplasm or cancer conferences or clinics in the hospitals under the present conditions of reduced civilian staffs may be difficult, but should be encouraged.

It is recommended that more attention be given to the education of the medical profession than of the laity. The management and care of the cancerous patient should be a group effort in which all members of the medical profession can play an important rôle. But this can be done only if they individually and collectively appreciate how much or how little the several means at their disposal can offer the patient in either control of the neoplasm or palliation of symptoms, and act on that knowledge and the criteria of what will afford the patient the most comfort and relative well-being for the longest period of time.

It was moved, seconded and carried that the attention of the C.M.A. Central Committee on Cancer should be directed to Dr. Peirce's recommendation regarding the education of the medical profession in the management and care of the cancerous patient.

### **Committee on Post-Graduate Education**

Dr. W. J. McNally, chairman of the Committee, said:

Your committee has attempted to work through the district representatives on the Council. A special effort was made this year to arrange meetings in the districts bordering on Quebec City, but so far has been unsuccessful. The number of speakers at any one meeting has been cut down with a two-fold advantage; it allows more time for discussion and reduces expenses.

Meetings were held at Dolbeau, Shawville, Shawinigan, Buckingham, Sherbrooke, Granby, Valleyfield and Hull.

The travelling expenses to the eight meetings amounted to \$128.42 and have been defrayed by the Quebec Division. These meetings have all been well received and well attended. In each case our speakers have been given every courtesy and attention by the local group.

### Election of President

The Chairman then informed the meeting that Dr. H. R. Clouston had been elected President-Elect at the annual meeting on October 10, 1940. This was duly confirmed.

### Election of Officers and Executive Committee

The following officers were elected:

President-Elect—Dr. G. Vézina, Quebec.

Chairman of Executive Committee—Dr. D. S. Lewis, Montreal.

Past-President—Dr. L. Gérin-Lajoie, Montreal.

Honorary Secretary—Dr. A. W. Young, Montreal.

Associate Secretary—Dr. Georges Hébert, Montreal.

Honorary Treasurer—Dr. E. S. Mills, Montreal.

Montreal District—Dr. L. H. Gariépy, Montreal.

Dr. C. K. P. Henry, Montreal.

Dr. W. de M. Scriver, Montreal.

Pedford District—Dr. G. F. L. Fuller, Cowansville.

Huntingdon District—Dr. M. R. Stalker, Ormstown.

Hull District—Dr. H. B. Church, Aylmer.

Quebec District—Dr. W. H. Delaney, Quebec.

St. Maurice District—Dr. J. M. F. Malone,

Three Rivers.

Sherbrooke District—Dr. J. B. Winder, Lennoxville.

## Medical Societies

### Canadian Society for the Control of Cancer

The annual meeting of the Canadian Society for the Control of Cancer will be held at the Royal York Hotel, Toronto, on February 7th, at 12 noon, for the purpose of receiving the report of the Board of Directors, the report of the auditors of the Society and for the transaction of such other business as may properly be brought before the meeting.

### La société médicale des hôpitaux universitaires de Québec

Séance à l'Hôtel-Dieu de Québec, vendredi le 17 octobre 1941. Suivent les résumés.

#### PENTOTHAL INTRA-VEINEUX DANS LA CHIRURGIE DU GOITRE.—F. Hudon.

A l'Hôtel-Dieu de Québec, on utilisa le pentothal comme anesthésique intra-veineux dans 80 cas de thyroïdectomie.

Comme médication préliminaire les malades reçoivent  $\frac{1}{2}$  grain de nembutal par la bouche, la veille au soir, 3 grains de nembutal et une piqûre de  $1/6$  de morphine avec  $1/150$  d'atropine en injection sous-cutanée, une heure avant l'intervention chirurgicale.

On se sert d'une solution de pentothal à  $2\frac{1}{2}\%$  pour cent et l'injection se fait de préférence dans une veine du pied. On maintient l'anesthésie à un niveau très superficiel en gardant le réflexe conjonctival.

Nous avons comparé les résultats avec une série analogue de cas opérés sous anesthésie locale et sous anesthésie par inhalation.

La toux et les vomissements sont plus rares avec le pentothal.

On signale un cas de décès. Ce malade âgé de 68 ans, très maigre, très intoxiqué, considéré comme un risque excessivement grave, mourut d'une défaillance cardiaque vingt heures après l'intervention.

Comme conclusions, le pentothal dans la chirurgie du goître offre les avantages suivants: 1°—Il est inflammable et non explosif. 2°—Il baisse le métabolisme. 3°—Il rend l'induction agréable. 4°—Les vomissements sont rares. 5°—L'état anxieux disparaît. 6°—Le chirurgien opère plus à l'aise.

Tous les procédés sont bons et le pentothal semble devoir nous apporter un aide précieux.

### RÉSECTIONS TRANS-URÉTRALES: QUELQUES COMPLICATIONS.—A. Simard.

Au cours d'un certain nombre de résections trans-urétrales que nous avons fait à l'Hôtel-Dieu de Québec, durant l'année, nous avons rencontré quelques complications auxquelles nous avons dû faire face.

La première par ordre d'importance a été l'hémorragie post-opératoire qui, dans quelques cas, a été assez considérable pour nous inquiéter. La sélection du patient au point de vue de la congestion prostatique a dû être faite, et nous avons diminué considérablement les hémorragies en n'opérant pas tout de suite des malades qui présentaient un certain degré d'œdème au niveau de leur tumeur.

Le deuxième accident a été l'incontinence successive à la mise en place de la sonde Foley qui distend la région et fait persister, dans les jours qui suivent l'enlèvement de la sonde, une incontinence qui est très ennuyeuse pour le client, mais qui n'est pas permanente. Nous avons obvié dans un certain degré à cet ennui en racourcissant et en multipliant les séances de compression par cette sonde.

Le troisième ennui est l'infection subséquente par décollement de la muqueuse vésicale, et l'infection sous-jacente due à une résection trop poussée, et surtout au fait d'une infection pré-existante qui aurait dû être jugulée par le sulphonamye avant l'intervention.

### COLITE ULCÉREUSE GRAVE.—J. P. Dugal.

Un cas de colite ulcéreuse grave est rapporté. L'évolution de la maladie fut de cinq semaines et la mort survint à la suite d'une péritonite par perforations multiples du sigmoïde. Aucun agent thérapeutique n'a paru modifier le cours de l'affection. La sulfaguanidine fut inefficace.

### TRAITEMENT DU PIED BOT CONGÉNITAL DE LA NAISSANCE JUSQU'À 4 ANS.—L. P. Roy.

Le pied bot congénital est une lésion que l'on rencontre plus souvent chez les garçons. Les formes pures sont rares, c'est le varus équin que l'on rencontre le plus souvent: 80 pour cent des cas environ.

L'étiologie, la pathogénie sont passées sous silence. L'anatomie pathologique montre une déformation qui présente trois éléments: (a) l'équinisme; (b) la supination; (c) l'adduction.

Les parties molles: ligaments, muscles, tendons participent à la déformation. L'enfant peut être vu 1°—A la période de réductibilité complète qui peut durer des mois. 2°—A la période d'irréductibilité relative qui va jusqu'à 2 ou 3 ans en moyenne. 3°—A la période d'irréductibilité absolue à partir de 4 ans environ.

Il y a intérêt à voir le bébé le plus tôt possible après la naissance. Durant les premiers mois, des manœuvres manuelles de redressement suffisent. Il faut maintenir constamment en bonne position soit par élastoplaste ou par plâtre. Le pied corrigé, la chaussure appropriée le jour, et l'attelle la nuit maintiennent le pied.

A la seconde période, il faudra souvent agir sous anesthésie et par étapes pour corriger la déformation. Souvent la ténotomie du tendon d'Achille sera nécessaire, parfois le Phelfs-Kirmisson. A la dernière période, qui se voit rarement avant 4 ans, ce qui semble excellent est l'arthrodèse sous-astragalienne avec évidemment par-médio-tarsien. Cette intervention est suivie d'un plâtre pour 2 mois environ.

**MÉDICATION AYANT UNE ACTION SUR LE PERISTALTISME INTESTINAL DANS LES PÉRITONITES.**—  
F. Roy.

Au cours des péritonites, l'occlusion intestinale est une complication fréquente et toujours grave.

Depuis quelques années, dans les deux services de chirurgie de l'Hôtel Dieu, nous avons vu diminuer dans une grande proportion l'ileus paralytique au cours des péritonites appendiculaires grâce à l'emploi systématique, après l'intervention, de pituitrine, de pitressin ou de prostigmine dont l'action sur le tonus et le peristaltisme de l'intestin est bien connue.

Dans 311 cas de péritonites appendiculaires, 143 ont reçu de la pituitrine ou du pitressin en alternant avec de la prostigmine. Les résultats obtenus ont été tout à fait satisfaisants.

La prostigmine Roche semblerait agir davantage sur le petit intestin, tandis que la pituitrine ou le pitressin sur le gros. Ces produits ont aussi une action marquée sur la vessie. Il est exceptionnel de cathétérer un malade qui reçoit des injections d'un de ces médicaments.

D'après bien des auteurs, la prostigmine pourrait être injectée à des femmes enceintes sans danger d'avortement.

Nous donnons habituellement une ampoule de 10 unités de pitressin, de pituitrine ou une ampoule de prostigmine à 1 pour 2000, toutes les quatre heures, jusqu'à ce que l'intestin ait fonctionné et quo le ventre soit complètement déballonné.

Depuis quelque temps, nous associons le pitressin ou la pituitrine à la prostigmine surtout chez les grands malades. Le pitressin et la pituitrine, en plus de leur action sur l'intestin, agissent favorablement sur la pression artérielle, le rein et la transpiration.

Comme beaucoup de chirurgiens américains, nous faisons un usage fréquent de la prostigmine pour prévenir et traiter la distension intestinale à la suite des opérations les plus diverses dans l'abdomen.

Dans aucun cas les malades n'ont présenté de réactions toxiques ou même désagréables.

Réunion de cette Société tenue à l'Hôpital Laval, Ste-Foy, Que. Le 21 novembre 1941, à 8 30 heures du soir. Suivent les résumés:

**L'A TUBERCULOSE CONJUGALE**—R. Desmeules, L. Rousseau et Ph. Richard

La tuberculose conjugale existe sûrement mais dans une proportion encore imprécise. La fréquence varie de 3 à 45 pour cent selon les conditions d'observation et selon l'emploi des moyens cliniques, biologiques et surtout radiologiques d'investigation. La tuberculose du conjoint apparemment sain est lié au problème de la surinfection exogène auquel les écoles française, allemande et américaine attachent une importance fort différente. Cette tuberculose exogène ne présente pas de type radiologique fixe. Elle est considérée comme un réveil d'un vieux foyer mal éteint, comme une réactivation endogène sous une stimulation exogène. Elle agit tantôt dans le sens vaccinant, tantôt dans le sens aggravant selon le degré d'immunité du contaminé. Les sur-infections additionnelles augmentent de façon nette la morbidité et la mortalité tuberculeuse du conjoint apparemment sain, porteur de séquelles du passé.

Quant au conjoint non infecté, l'observation démontre qu'il est voué de façon presque certaine à la tubercularisation. L'étude soigneuse des statistiques a l'aide de la méthode radiologique oblige à une enquête prolongée même après la mort du contaminateur. Ce délai doit être poussé à au moins cinq ans. La préémission masculine existerait dans plus de 70 pour cent des cas. Nous ne pouvons admettre les prétentions de Lumière sur l'hérédité tuberculeuse. Elles s'appuient sur des faits contestables, critiquables et entachés d'erreur. L'existence et la fréquence de la tuberculose conjugale oblige à des

mesures prophylactiques adéquates surtout de l'homme à la femme. Les conjoints tuberculeux doivent être spécialement surveillés en raison du danger qu'ils sont pour leur entourage familial et social.

**LA SERO-AGGLUTINATION DE LA TUBERCULOSE**—  
M. Giloux

Le séro diagnostic n'est étudié que sous la forme séro-agglutination, ayant un principe et une technique identiques, du moins en partie, à ceux de la réaction de Widal. Employée pour la première fois en 1898, par Arlong et Courmont, la séro agglutination tombe dans un demi oubli, dont elle sort dernièrement sous l'impulsion scientifique de l'Ecole de Lyon. La base de la réaction est une souche de bacille de Koch bien homogène et facilement agglutinable, comme la souche SA P C.

*Réultats obtenus sur 227 séro agglutinations effectuées à l'Hôpital Laval*

Adultes:	pour cent
Tuberculoses médicales—positives	82 6
Tuberculoses chirurgicales—positives	75 0
Enfants:	
Tuberculoses médicales—positives	90 9
Tuberculoses très graves—positives	29 4

Le séro diagnostic est très utile comme confirmation de la tuberculose chez l'adulte, comme élément de diagnostic chez l'enfant, surtout dans la période ante allergique, et comme test pronostique dans les formes graves, évolutives de la tuberculose.

**RESULTATS DE THORACOPLASTIE À L'HÔPITAL LAVAL**—J. P. Roger et J. M. Lemieux

Ces deux auteurs ont d'abord donné une vue d'ensemble de la thoracoplastie historique de la question, grands principes généraux de la technique, indications. Puis après avoir repassé quelques statistiques internationales, ils ont produit celles de l'Hôpital Laval.

Malades opérés de 1931 à 1941 ..... 66  
Total des temps opératoires ..... 157

<i>Réultats</i>	
Malades guéris	29 pour cent
Malades améliorés	40 pour cent
	69 pour cent
Malades aggravés	3 8/11 pour cent
Malades stationnaires	7 3/11 pour cent
	31 pour cent

Malades morts depuis 1931 ..... 20 pour cent

*Mortalité opératoire:*

Interventions ..... 157  
Morts précoces imputables à l'intervention ..... 4

Ce qui donne une mortalité opératoire d'environ 2 1/2 pour cent.

**DRAINAGE CAVITAIRE SUIVANT LA MÉTHODE DE MONALDI**—L. Rousseau

L'auteur rapporte l'observation d'une malade âgée de 26 ans, qui fut traitée par pneumothorax artificiel en 1937, pour une tuberculose cavitaire du poumon gauche. En 1941, cette malade fut hospitalisée de nouveau pour une lésion cavitaire siégeant au poumon droit. Un pneumothorax artificiel ayant été impossible à réaliser et une thoracoplastie considérée dangereuse, un drainage cavityaire suivant la méthode de Monaldi fut institué le 10 septembre 1941. Les résultats de cette intervention, quoique incomplets après 2 1/2 mois, permettent d'entretenir des espoirs sur le traitement de certaines formes de tuberculose par cette nouvelle thérapeutique. En effet, à la suite du drainage, les cavités diminuent considérablement de volume en même temps que le pus devient moins riche en bacille de Koch.

**TUMEUR SOUS FRONTALE CHEZ UNE TUBERCULEUSE.—J. Sirois.**

Nous vous présentons ici l'observation d'une tuberculose pulmonaire, atteinte en plus d'une ostéo-arthrite tuberculeuse, scapulo-humérale droite qui a développé un syndrôme sous frontal ayant entraîné une intervention chirurgicale, pour l'ablation d'une tumeur sous frontale. Après le début d'une tuberculose pulmonaire, la malade commence à présenter un syndrome d'hypertension puis des signes neurologiques localisateurs à la région sous frontale droite. En décembre 1939, une biopsie est pratiquée à la région sus-frontale droite au moyen d'une légère trépanation et comme à cette date un diagnostic histopathologique d'épithélioma avait été porté, une série de traitements radiothérapeutiques a été donnée. Après une légère amélioration de quelques mois, en janvier 1940, la malade fait des crises d'épilepsie généralisée.

L'examen clinique à cette date nous révèle un syndrome Foster Kennedy; rien d'autre de particulier. La radiographie du crâne cependant nous révèle que la petite aile du sphénoïde droit est érodée. Procédant par élimination, nous venons à la conclusion que la malade est porteuse d'un méningome ayant pris son point d'origine à la petite aile du sphénoïde droit. Le 31 mars 1940, une craniotomie frontale droite est pratiquée. Nous trouvons alors une masse griseâtre, 6.5 cm. de largeur et 1.5 cm dans sa plus grande épaisseur, ayant pris son point d'origine à la région sous-frontale à la petite aile du sphénoïde droit et remontant, en repoussant le lobe frontal droit jusqu'à la partie moyenne de ce dernier. L'ablation a été faite au complet.

Les suites opératoires n'ont rien présenté de particulier et le dixième jour la malade peut se lever. L'acuité visuelle du côté droit revient 10/10; depuis ce temps la malade n'a pas fait de crises d'épilepsie; elle a vu son syndrome d'hypertension disparaître et surtout elle commence à percevoir la couleur de son œil gauche avec lequel elle ne voyait plus depuis deux ans. L'examen histo-pathologique nous a révélé que nous avions affaire apparemment à un gliome fibrillaire d'une variété tout à fait particulière, dont l'histogénése fait le sujet d'une étude en cours.

RICHARD LESSARD,  
Secrétaire.

## University Notes

### McGill University

Dr. G. Lyman Duff, head of the department of pathology at McGill, has been appointed curator of the Royal Canadian Army Medical Corps medical museum, it was announced at the university recently.

This museum, which is at present housed at McGill, consists of material from the first World War. Dr. Duff succeeds the late Dr. Maude Abbott as curator.

Dr. J. F. McIntosh, secretary of the faculty of medicine, has been appointed the university's representative on the Medical Council of Canada, which is the licensing body for the Dominion, succeeding Dr. A. Grant Fleming, former dean of the faculty.

Dr. R. H. M. Hardisty, of the faculty of medicine, has been appointed attending physician at the Royal Victoria College, succeeding Dr. W. F. Hamilton, who served a long period of years in this capacity.

## Letters, Notes and Queries

### A Letter from East Africa

The following letter has been sent us through Dr. G. Allison, of Winnipeg. It was written to Dr. George Bedford who has kindly allowed us to reproduce it.—[Ed.]

My dear Bedford,

It was very pleasant to have a letter again from you. This time it took exactly four months to reach me, but considering the conditions one must be grateful. Our letters to and from England take anything from six to eight weeks. Even air mail letters only go by air to the Cape and thence by steamer.

You will have seen from the papers that our people out here have done wonders. There was a period of great anxiety at first as we were totally unprepared but as soon as the South Africans got going and with them our East African forces, white and native and also the excellent troops from West Africa, Nigeria and the Gold Coast things rapidly improved. When one realizes the distances they had to cover and the terrible terrain especially that between the River Tana and the Juba one recognizes that there was some wonderful organization especially in transport. Kenya was full of motorized units. The total march from this through Somaliland to Addis Ababa was 1,700 miles and over much of that our forces made 20 to 25 miles a day.

In September last I was appointed consultant in Dermatology and Syphilology to the East African Forces and have thoroughly enjoyed my work. Some of it has been most interesting. I visit three hospitals once a week. Two of them are for white men, South Africans, British and Rhodesians. The other is a huge hospital for Africans. It has about 1,200 beds. There one meets every race in Africa from Abyssinians to Cape boys and from Nigeria to Somaliland. I only wish we had a first-class ethnologist with us. We have among others swells a professor of anatomy from Johannesburg. He is a keen anthropologist but his job is training native personnel. Among other men of eminence out here we have Col. Ogilvie, the Guy's surgeon who writes much about wound treatment. He was, of course, in the 1914-18 war.

I have got together a pretty good lot of men who are keen on anti-venereal prophylaxis and I think they are doing good work. You will be surprised, perhaps, to learn that our sickness rate is low. Up to date the death-rate of white troops from all forms of sickness is only at the remarkable figure of 1.8 per 1,000 *per annum*. Among the black troops it is only 3.8 per 1,000 per annum. The deaths in the field have been

Answers to letters appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

very small. But one does not wonder at that when one sees the appalling Italian material. I have had a number under my care and those from Southern Italy are miserable specimens, starved, dirty, ill-clad and many state that they have had no pay for years. There are a few well-set up fellows but one finds on enquiry that they come from the north, Turin, Milan etc.

You ask about psoriasis. I have been in Kenya since 1927 and only recently I saw a typical psoriasis in an African. He was one of the dressers in one of the hospitals, and of course had been used to European clothing for years. Since I came out I have been on the look out for this disease and wherever I have enquired the answer has always been that it is very rare in the black-skinned races. I have seen it in Indians. (We have many Indians in the Colony, petty traders, artisans etc.).

I well remember that before I left home we tried light baths on some bad cases of psoriasis without any other local treatment and with satisfactory but rather slow results. I see that Gougerot, the Paris specialist, recommends eosin in a 2 per cent paint every third day and the intermediate treatment is of a 2 per cent eosin ointment. He combines this with salt water baths, ordinary kitchen salt  $\frac{1}{4}$  lb. in a full bath. You might like to try it if you have not done so. I shall as soon as I get a white patient with psoriasis. Eosin sensitizes to light!

Frankly I don't think any of these measures is more than a palliative.

Your observation as to cold weather is important and again suggests that the exclusion of radiations through thicker clothes may be a factor.

Your remarks re sensitization to pollens reminds me of one of our bugbears. A very profitable crop out here above 7,000 feet is pyrethrum and quite a number of settlers have plantations. Unfortunately some of them have an idiosyncrasy and easily get sensitized and some have had to give up a profitable living. The pyrethrum is, of course, used largely in the form of a paraffin spray against mosquitos etc. Quite a lot is exported to the U.S.A. and other countries. Our pyrethrum has two flowering seasons a year and the flowers are better than the Japanese. Hitherto the stuff came almost entirely from Japan. I have one of the youngsters at the Medical Research Laboratory trying to get an antigen for prophylactic purposes. Some excellent work on the pyrethrum has been recently done at the Rothamsted Institute at home and a good paper appeared recently in the *British Journal of Dermatology*. So far we have got an ethereal extract but it causes so much local reaction that it is impracticable.

Do you know that I still have to hammer into the men out here that scabies is "the itch"? But much of our time in the military hospitals is taken up in treating the dermatitis caused by

over-zealous treatment. On the whole I am making my people stick to sulphur. I cannot get benzyl benzoate, and derris appears to be too risky. I know bad scrotal dermatitis has followed the use of standard rotenone.

Next to the parasitic affections I have found the urticarial group give me the most trouble among Europeans out here. Quite a number of them have had amoebic dysentery and one has wondered if that leaves weak spots in the mucosa of the alimentary canal and lets proteins in.

JAMES H. SEQUEIRA.

P. O. N'Gong,  
Kenya, September 5, 1941.

## Special Correspondence

### The London Letter

(From our own correspondent)

*The Nutrition Society.*—It is doubtful if there has ever been such a gathering of experts as met in Cambridge, 250 strong, for the first scientific meeting of this new society last month. Sir John Orr was regrettably absent on urgent business for the Government but otherwise the platform was filled as advertised, with Gowland, Hopkins, Charles Martin and Joseph Bancroft to welcome and inaugurate the society. An audience which included the past and present presidents of the Royal College of Physicians, the chief scientific expert of the Ministry of Food, physicians, surgeons, gynaecologists, plant experts, milk experts, agricultural chemists and physiologists, together with Government officials, economists, dietitians and statisticians, gave serious consideration to nine opening speakers on "The evaluation of nutritional states". Dr. L. J. Harris spoke of laboratory methods and Dr. B. F. Platt of clinical signs with other speakers on both aspects. The tests of pregnancy and of growth upon border-line nutritional states were discussed and then three fascinating papers on the nutrition of farm animals brought out various obvious lines of study as yet unemployed as regards work on human nutrition. If enthusiasm is any index of value then the new society is clearly going to be of historic importance in providing the blue prints for building up a race from which under-nutrition has been banished.

*Hospitals in the future.*—While all sorts of committees consider the future of medicine there has been a notable silence from official, that is, Government quarters. But this silence was significantly broken recently when the Minister of Health indicated the Government's policy for the hospital service of the nation after the war.

This can be briefly summarized as follows: Appropriate treatment readily available for everyone in need of it, local authorities dealing with large areas to be primarily responsible in close co-operation with existing voluntary hos-

pitals, patients expected to make payments, by contributory schemes or otherwise, towards cost of treatment, and special consideration for the problems of the teaching hospitals by means of increased educational grants. It is very satisfactory to have an early forecast of the scheme, for hospitals have got to plan for the future and it is already clear that rebuilding some of the damaged institutions at the Government's expense, so to speak, must carry with it the obligation to fit into a plan rather than perpetuate that competitive individualization which has been an unfortunate attribute of many voluntary hospitals in certain areas. Here is Government support for "regionalization", that scheme for the provincials whereby all hospital services are grouped on a co-operative basis, and for the first time direct financial assistance from the central Government is assured.

Meanwhile the question of contributions by patients receives a further step towards a satisfactory solution by yet another far-sighted action by Lord Nuffield. He has created a guarantee fund of £150,000 to assist provident schemes for the mutual insurance of the middle and professional classes to meet the cost of illness requiring specialized or surgical treatment in hospital pay beds or nursing homes.

*Hospital underground.*—From hospitals of the future to hospitals as they are today means a peep at wartime conditions. One of the problems facing a hospital commandant is what he is to do if his building becomes unusable—particularly when this will undoubtedly mean casualties in the immediate district. The theoretical answer is to "switch" to a neighbouring hospital but there are obvious objections to this and casualties may still pour in to the damaged building. Hence the wise commandant looks around to see what he can prepare in the shape of an emergency building. An ingenious solution of this problem has recently been recounted in the medical press. A large store, near to the hospital was chosen and a portion of the basement set aside for the purpose. This contained a restaurant and several lavatories—which gave the necessary facilities as regards plumbing—several lifts, two of which were for goods and communicated with covered bays—suitable for unloading ambulances—and useful wide staircases also communicating with other levels. An independent electric supply was assured and enough space set aside for a theatre and eighteen beds, capable of extension by taking in shop space to 50 beds within an hour and 120 beds within two hours. Interlocking screens were used to limit the space in use and the theatre was ventilated by forced draught through fine screens. An x-ray plant and dark room were also available.

The capital cost was remarkably modest, although lower than represented by the results because of the generosity of the store owners. This ingenious underground hospital came into use and dealt with 70 patients on one occasion

as well as acting for a whole week as the main hospital of the district while repairs were effected to the original hospital, temporarily unusable.

*Young doctors.*—While discussions of the future continue and the medical curriculum seems about due for one of its periodical revisions, a psychologist has thrown a mild bomb shell into the arena by a reasoned plea for qualification at an earlier age. Let students start their medicine at 16, he urges, so as to get qualified by 21. This will give more enthusiastic and pliable students and by earlier qualifications will present the newly qualified with an opening to his career corresponding with his full manhood. Financially this scheme also presents many obvious advantages and in fact corresponds to what used to happen twenty or more years ago in many Scottish universities. There are many sociological and psychological arguments in favour of this plea which is certainly a novel point of view to have put before us at the present time.

ALAN MONCRIEFF.

London, November, 1941.

## Abstracts from Current Literature

### Medicine

Clinical Studies with the Aid of Radioactive Phosphorus. I. The Absorption and Distribution of Radio-phosphorus in the Blood and its Excretion by Normal Individuals and Patients with Leukæmia. Erf, L. A. and Lawrence, J. H.: *J. Clin. Invest.*, 1941, 20: 567.

The authors indicate the amount of radioactive phosphorus ( $P_{32}$ ) retained by various fractions of the blood of 4 normal individuals, 12 patients with myeloid, and 15 with lymphoid leukæmia, and the variations in retention following the administration of radio-phosphorus when given orally, and/or intravenously, and when accompanied by varying amounts of non-radioactive phosphorus ( $P_{31}$ ). The purpose of the paper also is to indicate the distribution of  $P_{32}$  in the bone marrow and in various fractions of white blood cells; and thirdly, to indicate the amount of radio-phosphorus excreted in the urine in these cases.

It was found that (a) more radio-phosphorus is retained by patients with leukæmia when it is administered intravenously than when given orally; (b) marrow retains radio-phosphorus in higher concentrations than blood per unit volume and at the same time period; and (c) relatively greater concentrations of  $P_{32}$  occur in the nuclei than in the cytoplasm of myeloid leukæmia cells, while no differences in retention of  $P_{32}$  were noted in the nuclei and cytoplasm of the lymphoid cells studied.

From the findings presented phosphorus apparently passes from the acid-soluble substance of leukæmic white blood cells to substances of nucleoprotein and phospholipoid character. The practical point to be emphasized is, that if high concentrations of radio-phosphorus are to be obtained in circulating white blood cells, P32 should be introduced intravenously and it should be accompanied by the smallest amount of non-radioactive phosphorus possible. Reducing the phosphorus intake in the diet should also be considered.

STUART R. TOWNSEND

**Studies on Neoplasms with the Aid of Radioactive Phosphorus. III.** The phosphorus metabolism of the phospholipid, acid soluble and nucleoprotein fractions of various tissues of normal and leukæmic mice following the administration of "tracer" and "therapeutic" doses of radio-phosphorus. Tuttle, L. W., Erf, L. A. and Lawrence, J. H.: *J. Clin. Invest.*, 1941, 20: 577.

"Tracer" doses of radio-phosphorus (P32) are small amounts which are conceivably insufficient to cause significant changes in the metabolism of the animal's cells in which they are retained, while "therapeutic" doses are large amounts of P32 which significantly alter the metabolism of cells because of the quantity of beta-radiation spontaneously emitted.

The results indicate that, when large doses of radio-phosphorus were used, the effects of the irradiation could be measured. Therefore, in interpreting the results of metabolic investigations, it must be known whether large or small doses were used if radioactive agents were employed in obtaining these results. Since the results reported here, when 8 microcuries per animal were used, are identical at the 48 hour period with those when 5.5 microcuries were used and almost identical with those where 30 and 50 microcuries per animal were used, it would seem safe to conclude that 8 microcuries per animal is a safe "tracer" dose for mice on which such studies are to be made.

The results also indicate that there is no difference in radio-sensitivity of the metabolic processes studied in the normal animals when compared with those of leukæmic animals.

This technique could well be used as a method to compare the radiosensitivity of various types of cellular metabolism both in normal and neoplastic tissues, and it may prove to be a valuable method of comparing the effects on these tissues of different types of radiation such as x-radiation, or neutron radiation. Less P32 was retained in the "phospholipid", "acid soluble" and "nucleoprotein" fractions of spleen, liver, and lymph nodes, and the carcasses both of normal mice and mice with lymphoma after intraperitoneal administration of large or "therapeutic" doses of radio-phosphorus, than when small or "tracer" doses were given.

STUART R. TOWNSEND

**Quantitative Treatment of Pernicious Anæmia: Response to Initial Massive Dose of Liver Extract in Relapse.** Askey, J. M.: *J. Am. M. Ass.*, 1941, 117: 905.

Satisfactory clinical haematological and neurological responses judged by available criteria, were obtained in 16 of 19 patients who had pernicious anæmia and were in relapse as a result of the injection intramuscularly of a massive dose of liver extract.

A massive initial dose to stock the liver, followed by monthly doses to maintain adequate storage, appears to be sufficient to give optimum results in the majority of such patients in relapse.

STUART R. TOWNSEND

**Primary Degeneration of the Granular Cells of the Cerebellum: An Unusual Form of Familial Cerebellar Atrophy Occurring in Early Life.** Norman, R. R.: *Brain*, 1941, 63: 365.

In a family of seven children whose parents were healthy and not related, the oldest was deaf, the third, seventh, and fifth were two sons and a daughter respectively, affected with congenital cerebellar ataxia, and mental defect. The brains at autopsy were small; the cerebellums were extremely small and sclerosed. The gross configuration was normal; the Purkinje cells were well preserved, but there was complete atrophy of the granular layer.

In a second family a son and daughter were similarly affected: four other children were normal.

MADGE THURLOW MACKLIN

## Surgery

**Chronic Appendicitis.** Warren, R. et Ballantine, H. T.: *J. Am. M. Ass.*, 1941, 117: 994.

Etudiant les résultats post-opératoires de l'appendicetomie pour l'appendicite du type chronique, les auteurs en arrivent aux conclusions suivantes: L'appendicite chronique est une entité clinique constituée par une douleur récidivante de la fausse iliaque droite, ordinairement en rapport avec un état pathologique passé ou présent de l'appendice. Les patients présentant une longue histoire de crises douloureuses nombreuses n'ont pas d'aussi bons résultats que ceux présentant une courte histoire avec attaques moins fréquentes. Sur 138 cas étudiés, trois quarts des patients ont obtenu un soulagement partiel ou définitif des symptômes pré-opératoires, et un quart n'a obtenu aucun soulagement et même ont été aggravés. De plus les résultats ont été meilleurs chez les hommes que chez les femmes. La mortalité opératoire est très basse, mais il ne faut pas oublier que la morbidité et la période d'incapacité est imprévisible. Il semble donc par conséquent que l'on doive observer une attitude plus conservatrice et moins chirurgicale à l'égard de l'appendicite chronique.

Comme notes personnelles à cette excellente mise au point, il nous fait plaisir de constater que l'école française de M. Chiray entre autres, professa pendant assez longtemps les mêmes enseignements.

YVES CHAPUT

**Combining Splenectomy with Total Gastrectomy—“Splénectomie associée à la gastrectomie totale”.** Lahey, F. H. and Marshall, S. F.: *Surg., Gyn. & Obst.*, 1941, 73: 341.

La gastrectomie totale est un procédé chirurgical qui a maintenant fait ses preuves. Les auteurs l'ont, pour leur part, employée dans 33 cas. Cinq fois, ils ont procédé en même temps à une splénectomie. Sans en recommander l'usage définitif et généralisé, ils en conseillent la simultanéité chaque fois que la grande courbure de l'estomac est prise et que les ganglions néoplasiques ont envahi notamment l'épiploon gastro-splénique ou qu'il y a avantage à faire une résection la plus radicale possible. L'opération en est facilitée sans que le risque opératoire soit accru.

L'addition de la splénectomie à la gastrectomie totale offre l'avantage de dégager les vaisseaux artériels de l'estomac et de rendre visibles à l'œil nu les vaisseaux spléniques après décollement colo-épipoïque. Les auteurs expliquent leur technique opératoire et les précautions à prendre pour la rendre efficace et sans danger. La cavité qui en résulte est assez vaste pour permettre une grande souplesse de manœuvres pour la fixation du jéjunum anastomosé. La visibilité est parfaite et directe.

En conclusion, les auteurs présentent la splénectomie, dans certains cas précis, comme un progrès d'amélioration technique de la gastrectomie totale.

PIERRE SMITH

**Acute Intussusception.** Mayo, C. W. and Woodruff, R.: *Arch. Surg.*, 1941, 43: 583.

Acute intussusception is a clinical and surgical emergency, which can be completely and permanently cured by immediate and competent surgical intervention. With indecision and procrastination tragedy often results before the institution of treatment. The authors review the histories of 55 ex-patients classified as acute intussusception. These were 38 boys and 17 girls. The youngest patient was twenty-four days old. Eighty per cent were less than two years of age. In two of the patients a Meckel's diverticulum was the cause. In the other 53 patients there was no definite causative factor.

Prompt surgical intervention is the only rational treatment of this condition. Drop ether anesthesia is the method of choice for infants. A right paramedian incision is made. The pathological condition can be righted by simple manual reduction. That is, by gentle milking from below upward with only the slightest traction of the proximal loop. In 80 per cent of the series, reduction was accom-

plished by this method. If complete reduction cannot be made on account of œdema of the tissues, cutting of the constricting neck of the intussusception with scissors and subsequent repair of the wall of the bowel may well be considered. When gangrenous or necrotic bowel is present, either exteriorization or resection with primary anastomosis is indicated. The former seems to be the procedure at most times. Primary anastomosis has a high mortality rate. The hospital mortality rate in the series was 23.6 per cent. Surgical shock, superimposed on the toxæmia and on the already depleted system of the infant was the chief factor in the hospital mortality.

To combat the toxic reaction, a small transfusion of blood is given before operation as well as fluids and electrolytes intravenously during the course of the operation to bring the concentrations into the normal range. The authors use group IV blood (Moss classification) without taking time to type or cross match the blood.

G. E. LEARMONT

### Obstetrics and Gynaecology

**Hepatic Haemorrhage in Stillborn and New-born Infants: A Clinical and Pathological Study of Forty-seven Cases.** Henderson, J. L.: *J. Obst. & Gyn. of the Brit. Emp.*, 1941, 48: 377.

Forty-seven cases of hepatic haemorrhage collected from a series of 1,312 post-mortem examinations on stillborn and new-born infants have been analyzed. Rupture of the liver, with intraperitoneal haemorrhage, was found in 24 cases, an unruptured subcapsular haematoma in 22, and in 1 a deep-seated laceration. The haemorrhage was situated on a surface subjacent to the abdominal or thoracic wall in three-quarters of the cases. There was an associated intracranial haemorrhage in 20 cases. Visceral haemorrhage, other than hepatic, occurred in several instances. Signs of asphyxia were observed in three-quarters of the cases.

The condition was 3 times as frequent in still-born infants as in those who died within a week of birth. The incidence was much higher in abnormally large infants and in premature infants than in those of average weight.

Obstetrical abnormalities occurred in the great majority. In only 3 cases was the delivery of the mothers normal and spontaneous.

P. J. KEARNS

**Urological Complications of Carcinoma of the Cervix Uteri.** Todd, T. F.: *J. Obst. & Gyn. of the Brit. Emp.*, 1941, 48: 334.

An unselected group of patients suffering from carcinoma of the cervix, mostly in stage 2 or stage 3, were examined cystoscopically through a Kelly direct-vision cystoscope, and radio-opaque catheters were passed into the ureters. A stereoscopic x-ray was then taken after the

radium applicators had been inserted, and from the films the physiologist at the Holt Radium Institute was able to make an exact reconstruction in space of the position of the ureters relative to the radium units.

Ninety patients had had the urinary function investigated prior to treatment. Of these, 32 had demonstrable lesions and 58 showed normal renal function. A careful follow-up of these 58 patients showed the following findings: 31 died within a year and in only 2 did any urological condition become recognized. Three patients had further uroselectan examinations 6 months after treatment without any obstruction being shown. The exact cause of death is unknown in the majority and the autopsy was unobtainable except in 2 cases. In 27 of the patients still alive 13 were treated over a year ago and over 14 over 2 years ago; in none of these has any urological complications been recognized so far, but urological investigation has not been carried out since treatment.

P. J. KEARNS

#### Endocrine Factors in Secondary Amenorrhœa.

Fluhmann, C. F. and Murphy, K. M.: *Am. J. Obst. & Gyn.*, 1941, 42: 656.

This report is based on 73 clinic patients with a secondary amenorrhœa for which no definite cause could be ascertained. The age of the patients varied from fifteen to thirty-eight years at the time of observation, and the duration of the amenorrhœa from six weeks to ten years. Amenorrhœa set in after an abortion in 2 instances and after a full-term pregnancy in 5 cases. Eleven, or 15 per cent, gave a history of a previous pelvic operation. The range and the mean of the menarcheal age showed no significant difference from a control group of normal women.

A preceding menstrual disorder, most often oligomenorrhœa, was noted in 50, or 68 per cent, of the whole group. In 29, or 39 per cent, the disturbance had been present since the menarche and in 21, or 29 per cent, it appeared for varying periods immediately preceding the amenorrhœa. Infertile marriages were present in over 30 per cent of the married women in the group.

A definite tendency to obesity was observed since 38 or 58 per cent, of 66 patients were above the normal standard estimates of the Medico-Actuarial Insurance Table. No clear-cut instances of marked hypo- or hyperthyroidism were included, but a basal metabolic rate of between minus 10 and minus 27 per cent was found in 29, or 44 per cent of 66 cases. The oestrogenic hormone content of the blood was determined at weekly intervals in 52 patients. A cyclic increase in the hormone concentration was observed in 46 cases, while repeated positive tests were noted in 4 instances and consistent negative results in only two. An excessive amount of anterior pituitary gonadotropin was present in the blood of 7 or

20 per cent of 34 women. It is felt that this observation is evidence of a serious or prolonged ovarian disturbance.

A period of uterine bleeding appeared before any treatment had been instituted in 7 or 33 per cent of 22 patients.

Ross MITCHELL

**Histidine Metabolism in Normal and Toxæmic Pregnancy.** The Excretion of Histidine in Normal Pregnancy Urine and in the Urine of Patients with Toxæmia of Pregnancy. Kapeller-Adler, R.: *J. Obst. & Gyn. of the Brit. Emp.*, 1941, 48: 141.

Histidine is a constituent of the urine throughout normal human pregnancy, the excreted amounts ranging between 15 and 50 mg. per cent. Histidinuria is not appreciably affected in cases of mild pre-eclamptic toxæmia, but is considerably diminished in patients with serious symptoms of pre-eclamptic toxæmia. In cases of severe pre-eclamptic toxæmia histidine is not to be found in the urine, or only traces are found. So constant are these findings that a marked diminution, or total absence, of histidine excretion can be used as a diagnostic sign of severe toxæmia of pregnancy.

P. J. KEARNS

#### Pædiatrics

**The Diagnosis and Conservative Treatment of Bronchiectasis in Children.** Barnsby, B. E. and Bonham-Carter, R. E.: *Arch. of Dis. in Child.*, 1941, 16: 95.

Successful postural drainage and satisfactory bronchograms in bronchiectasis depends on an intimate knowledge of the anatomy of the bronchial tree. The authors emphasize this by the presentation of typical bronchograms, from which the anatomy of the bronchial system is reviewed.

The procedure for bronchography is described, which is carried out following preparatory dependent drainage. A basal or general anaesthetic is used. Local anaesthesia has been found satisfactory in the case of children over ten years. During injection the patient must be manoeuvred into various positions for proper filling of the desired lobes. In their description of maintenance of posture, the various positions of the patient are outlined. For adequate drainage of the middle and lower lobes the authors highly recommend the incorporation of suitable wedges into the jacket worn by the patient. The purpose of such a wedge is to produce partial rotation of the chest. It is advisable for the child to spend eighteen hours daily in postural drainage while in hospital, and the entire night at home. Other means of treating bronchiectasis were not presented.

K. L. McALPINE

**The Relation of Infantile Mastoiditis to Infantile Mortality.** Leathart, P. W.: *J. Laryn. & Otol.*, 1941, 56: 320.

The author believes that 80 per cent of infant deaths from air-borne or food-borne

infection can be prevented. These children he believes die from mastoiditis which is unrecognized and untreated. Diagnosis can always be positively made from the following features. First the child is under one year of age and too ill to sit up. Second he suffers from a food or air-borne infection which is not improving. There is fever, evidence of pain, pulling at the ear or rolling the head, diarrhoea, vomiting, and dehydration. The auriscope may show pus, a pink tympanic membrane or nothing abnormal. One constant physical sign is palpable glands in the posterior triangle of the neck behind the sterno-mastoid muscle. Treatment is by posture to keep foodstuffs and infective material from reaching the middle ear. Always feed while in the sitting or propped up position. Never allow to lie on the back. Operate on cases which fail to improve and who become dehydrated. Operation is simple opening of the mastoid antrum and any cells present. If condition is bilateral do both mastoids at once. The results of such treatment reduce a mortality of 100 per cent to 20 per cent.

GUY H. FISK

### Neurology and Psychiatry

#### Concealed Ruptured Intervertebral Disks.

Dandy, W. E.: *J. Am. M. Ass.*, 1941, 117: 821.

Over 96 per cent of all ruptured vertebral disks occur at the fourth and fifth lumbar inter-spaces. The unilateral approach is adequate to find the lesion, whether it is at the fourth or the fifth disk. The use of contrast mediums such as lipiodol is not necessary to establish the diagnosis. The diagnosis is made on a history of low midline backache plus pain down the back of one or both legs. The pain is intensified by coughing and sneezing and the pain is recurring and not continuous. Dandy states that when this simple story is obtained no other lesion need be considered. There may or may not be diminution of the Achilles reflex or sensory or motor loss in the distribution of the fourth or fifth lumbar or first sacral nerve. The history of trauma, which is always the cause, may be difficult to elicit and need not be obtained. The history of recurring pain is essential to the diagnosis.

The author describes "concealed disks", which explain many negative explorations in the past. In his series they amounted to 28 per cent. In these cases the disk bulges so slightly that it will be found at operation only by careful inspection beneath the dura. The protruded area is usually adherent to the emerging spinal nerve. It is soft and fluctuant. When the covering ligament is incised a large sequestrum of cartilage does not protrude, but with almost no pressure the forceps sink deeply into the intervertebral space. With a curette soft, mushy, brownish material can be obtained from the cavity. The incision provides a vent for the subsequent gradual escape of the contained

injured disks. The results following the opening of these flat disks have been just as good as when a large sequestrum has been removed. The disclosure of this concealed type of disk is an additional reason for giving up iodized oil, air or other tests. They cannot possibly show the lesion, and with negative evidence the patient may be deprived of operative cure and passed along as neurasthenic. FRANK TURNBULL

**Lindau—von Hippel's Disease.** Craig, W. MeK., Wagener, H. P. and Kernohan, J. W.: *Arch. Neurol. & Psychiat.*, 1941, 46: 36.

Four cases of this rare disease are reported. In three of them no mention is made of other members of the family having been affected, nor is there any family history offered by which one might judge whether the lack of family history of the disease was due to actual lack of it, or to the fact that the patient was the only member of the family, or that the parents had died too young to have shown it. In the fourth instance, however, there was a very definite family incidence. Two parents, both of whom lived past 80 with no signs of the disease, had six children, one of whom was a case of Lindau's disease. The 25 children and the 9 grandchildren of the other five unaffected siblings were free from the disease also. The affected woman had 8 children, 2 of whom died in infancy; of the other 6, three sons and two daughters developed retinal and cerebellar angioma. The three children of two of these affected persons were still too young to have shown the disease even if they had inherited the factors for it. The patient in this family showed not only the cerebellar tumour, the angioma of the retina, but also the cystic pancreas which has been said to be pathognomonic of the disease.

**NOTE:** It would be in keeping with what is known of the inheritance of this disease which behaves usually as a dominant, being passed on from parent to some of the children, if the disease in three of the four patients in this report and in the mother of the fourth, arose as a dominant mutation. One child only in each family was affected, and then in the last family, a large number of the children inheriting the disease from the affected parent.

MADGE THURLOW MACKLIN

**Cerebellar Abscess of Otitic Origin in Nine Children.** Sehreiber, F.: *Ann. Surg.*, 1941, 114: 330.

This is a report of 9 cases of cerebellar abscess of otitic origin in children, treated by encephalotomy, with only one death. In all the cases the principal diagnostic and localizing signs were atonia and ataxia of the arm on the same side as the abscess. These signs could be observed whether the child was co-operative, irritable or stuporous, if the arms were lifted from the bed and allowed to fall away. In addition various symptoms of cerebral anoxia from increased

intracranial pressure were found: character change, headache, irritability, vomiting, papilledema and stupor. Operative treatment was delayed as long as possible to allow the abscess wall to thicken and the acute symptoms of meningitis and cerebritis to subside. No lumbar punctures were made for fear of medullary herniation. Use of barbiturate or narcotic drugs was avoided. Operation was the same for all cases. Under local anaesthesia a trephine opening was made over the suspected cerebellar lobe midway between the occipital protuberance and the mastoid top. A cannula was inserted into the abscess through a nick in the dura and the contents allowed to escape. The abscess cavity was never washed out. The wound was always closed tightly with silk. The only child in the series who died after operation was fighting not only an active staphylococcal meningitis, but also the untoward effects of a spinal tap, which made immediate operation imperative and prevented proper walling off of the abscess.

FRANK TURNBULL

### Pathology and Experimental Medicine

**Osteopetrosis.** Higinbotham, N. L. and Alexander, S. F.: *Am. J. Surg.*, 1941, 53: 444.

The patient who first came to the attention of the authors did so because he wanted something done to improve the appearance of his lower jaw which was unduly prominent, and had been growing progressively more so since he was a child. In addition to the excessive jaw development, causing spacing of the teeth, he had syndactyly of the 2nd and 3rd fingers on the left hand, and of the 4th and 5th toes on each foot. The family history was of interest because this man had two sisters and a brother who were similarly affected. His father had married twice and by his first wife had ten children; one died in infancy, one was a miscarriage, four were normal and four were affected with facial and hand deformities. By the second wife he had three children, all normal. He was not related to either wife. Roentgenograms of the skeletal system showed the marked deposition of calcium which has given the disease the name of "marble bones". The authors regard the condition as hereditary and dependent upon a Mendelian recessive character.

MADGE THURLOW MACKLIN

**Carcinoma of the Islands of Langerhans with Hypoglycæmia and Metastasis to the Liver.** Flinn, L. B., Beatty, G. A., Ginsberg, M. and Hemsath, F. A.: *J. Am. M. Ass.*, 1941, 117: 283.

A white woman, aged 45, who had undergone cholecystotomy 18 years before, and was moderately obese, complained of abdominal pain after eating, relieved by sodium bicarbonate, spells of faintness and numbness of the

lips and extremities. She was admitted during a 90-hour stuporous attack, during the first part of which she was unable to speak or recognize any one, appeared rigid, had glassy, watery eyes, and frothed at the mouth. An irregular, ill defined mass was palpated in the epigastrium. The blood sugar was extremely and persistently low. It soon became necessary to give continuous intravenous injections of sugar to keep the patient from entering the unconscious state, during which she would perspire freely, have occasional twitchings of the face and convulsive movements of the arms and legs. Operation was impossible. She died in coma after convulsions and hyperpyrexia. At autopsy a nodular, firm, pale gray tumour, 6 cm. across, replaced the head of the pancreas, and the adjacent retroperitoneal lymph nodes were infiltrated and measured from 1 to 2.5 cm. in diameter. In sections the tumour and these nodes showed masses and tufts of small cells of uniform size and structure closely resembling the islands of Langerhans. The liver was enlarged and marked by numerous pale nodules as large as 3 cm. across, and nearly half of the liver structure was found to be composed of these metastases, which, in section, showed cell patterns resembling islands of Langerhans, within cystlike spaces. It is assumed that the rapid increase in the severity of hypoglycæmia toward the end was due largely to insulin produced and liberated by the metastatic island cells in the liver.

C. C. MACKLIN

### Hygiene and Public Health

**Epidemic of Infectious Encephalitis.** Leake, J. P.: *Public Health Rep.*, 1941, 56: 1902.

This is a brief report of the incidence of infectious encephalitis in the North Central States and the Central Provinces during recent months. The following table summarizes the data:

	Cases	Deaths	Morbidity per 100,000	Case fatality percentage
North Dakota ..	1,080	96	167	8.9
Minnesota .....	515	..	..	..
South Dakota ..	180	11	..	6.1
Manitoba .....	434	42	66	9.7
Nebraska .....	250	40	19	16.0
Montana .....	64	6	12	9.4

The term "infectious encephalitis" is specially to be noted as indicating a variety of conditions, one of which, encephalitis lethargica, is now termed the Vienna type of infectious encephalitis. The type of encephalitis occurring in the epidemic under consideration appears to be identical with the western type of encephalomyelitis, although there is some evidence that on the fringe of the epidemic area the St. Louis type may have been a factor.

The means by which the virus is spread cannot be considered definitely settled. It is known that the mosquito can transmit the disease and in North Dakota it was a heavy mosquito year. Direct contact between individuals or between individuals and infected horses seems not to have been an important factor.

The disease was predominantly rural and in the older ages the sex ratio was nearly 3 males to 1 female. Evidence that the mosquito was the carrier was suggestive. As to the source of the infection it seems likely that there were other reservoirs than men and horses. The prairie chicken may possibly have been infected.

FRANK G. PEDLEY

**The Teachers and Tuberculosis.** Gregoire, G.: Notes on Tuberculosis (Quebec Provincial Committee for the Prevention of Tuberculosis), November, 1941.

Under the Education Act of Quebec teachers engaged in public or private schools must now produce a physician's certificate of health and an x-ray report of the lungs.

Of 523 teachers examined in Quebec City 16 (3 per cent) were considered tuberculous. They were refused employment and for the most part sent to sanatoria for treatment. It is believed that Quebec is the first province to require an x-ray examination of school teachers.

FRANK G. PEDLEY

**Cadmium Poisoning from Food.** *Industrial Hygiene*, National Institute of Health, U.S. Pub. Health Service, 1941, 1: 8.

The following is copied from the above mentioned pamphlet.

"During the past year numerous cases of cadmium poisoning have come to the attention of the U.S. Public Health Service. These cases have arisen from the contamination of food or drink with dissolved cadmium salts, owing to the preparation or storage of food or drink in cadmium-plated containers. Since metallic cadmium dissolves in the acids normally present in certain foodstuffs, a poisonous cadmium compound is formed. When this compound is ingested it causes acute poisoning very similar to so-called "food poisoning". The symptoms noted are pronounced nausea, diarrhoea, abdominal pains or discomfort, and general weakness.

"Prior to 1941 a total of 20 cases of cadmium poisoning, due to the ingestion of cadmium, had been reported in the literature. Since January, 1941, 315 cases of poisoning definitely have been caused by cadmium.

"Owing to the greatly increased technical use of cadmium in the manufacture and repair of various types of containers and the increasing use of cadmium for plating, the possibility of such containers being used for food purposes is apparent. Several instances have occurred

where cooking utensils have been repaired and unsuspectingly plated with cadmium which have later caused acute illness. It is also possible that cases of cadmium poisoning have been mistaken for food-poisoning owing to the similarity of the symptomatology in both cases.

"For these reasons the public should be warned against the use of cadmium-plated utensils for food purposes." FRANK G. PEDLEY

**A New Industrial Skin Cleanser.** Schwartz, L.: *Pub. Health Reports*, 1941, 56: 1789.

Harsh skin cleansers have frequently been found to be the actual causes of occupational dermatitis. The use of strongly alkaline soaps, volatile solvents, and powerful bleaching agents renders the skin more vulnerable to the action of irritant chemicals. Sulfonated oils do not defat the skin and act as emulsifying agents which emulsify dirt and greases on the skin and help to cleanse it. The process of sulfonation consists in mixing oil and sulphuric acid with subsequent neutralization. Many wetting agents are on the market to be used as soap substitutes, but these, while superior to soap as cleansing agents, do defat the skin and may act as sensitizers.

The author has found that by mixing sulfonated easter oil (pH 7.2) with 2 per cent of one of the wetting agents a good cleansing mixture is made and one which does not defat the skin. The mixture has been used satisfactorily in actual industrial practise. A list of commercial wetting agents is given.

FRANK G. PEDLEY

## Obituaries

Dr. David Frazer Gurd, who was a leading physician in Montreal before any of the citizens of the 20th century were born, died suddenly December 7, 1941, in his 91st year at his residence. He had been in poor health since last May, but prior to that had been quite active. On his 90th birthday Dr. Gurd was the honoured guest of the Royal Montreal Curling Club at a luncheon.

Born on February 8, 1851, Dr. Gurd was the son of Joseph Landers Gurd and Marianne Cowan, his father having come from County Monaghan, Ireland, in the year when the great ship fever plague broke out, establishing himself in business refining and merchandising oil. Young David attended the McGill Model School on Belmont Street until he was 13 years old when he became apprenticed in the drug business. In the evenings he took medical lectures at the medical school on Cote Street, and finally entered McGill for the full medical course, graduating in 1879 with the degree of M.D., C.M.

Dr. Gurd then went to England and spent four months at St. Thomas's Hospital, where he took the degree of L.R.C.P. He visited Lord Lister and was also an intimate friend of Sir William Osler when he came back to Canada and established a practice at Mackay and St. Catherine Streets. During the smallpox epidemic he vaccinated hundreds of persons every week, and it is stated that during his long career as a medical man he assisted at the birth of 3,500 babies.

Dr. Gurd was a man of much charm of manner and kindness of heart, and he went around among his patients for many years, attracting little attention, publicly carrying on his mission of helpfulness and relief

of the stricken with satisfaction in his ability to relieve suffering and distress. He witnessed many changes in his profession during the more than 60 years that he had practised and had the satisfaction of seeing not only his son, Dr. Fraser B. Gurd, who graduated in 1906, rise to an eminent position in the surgical world, only three months after he had passed his diamond jubilee as a physician, but also of seeing his grandson, Fraser Newman Gurd, graduate from his Alma Mater, McGill, with a doctor's degree, linking three generations practising at the same time. The grandson is now with the 6th Canadian Field Ambulance.

An enthusiastic tennis player, Dr. Gurd was prominent on the courts for many years and continued to play until within a few years of reaching the age of 90. He was a life member of the Mount Royal Tennis Club and he used to recall that when Fred Perry, then the leading amateur tennis player of England, came to act as honorary coach of the Canadian Davis Cup Team, in 1939, Perry challenged him to a match, which Dr. Gurd accepted. The game was set for 3 o'clock, but Dr. Gurd arrived 20 minutes later, and congratulated Perry on his win by default, according to the rules of tennis. Dr. Gurd was honorary president of the Province of Quebec Tennis Association, and was a life member of the Royal Montreal Curling Club.

Dr. Gurd was twice married and is survived by four children and ten grandchildren and four great-grandchildren.

Dr. Gurd, naturally, had many reminiscences of Montreal's early days. He was always devoted to various forms of athletics. Sixty-three years ago he played lacrosse with the senior Montrealers in the exact lot where his home now stands, on Bishop Street, a little above St. Catherine Street. He was quite a figure skater in his time and had often spent many hours on the old Victoria rink with Lord Dufferin, who later became Canada's Governor-General.

When he graduated from McGill in 1879, Montreal ended at Guy Street on the west. He well remembers the small-pox epidemic of 1885, when the city lost 4,000 of its population, which was then only a very small proportion of what it is today.

A remarkable factor of this epidemic was that no cases occurred west of Peel Street, then the better-class district, where all residents were vaccinated.

A riot took place in front of the Mayor's quarters and a by-law was hastily passed demanding that every body be vaccinated and that the sick be given the necessary hospital treatment. Happily, since then, Montreal had been more or less free from serious epidemics with the exception of the influenza outbreak in 1918.

The medical history of the city, too, has progressed very rapidly since his early practice, and much credit is due to the old tutors and medical men of McGill and the Medical School, which was then situated on Cote Street.

Dr. Gurd also had the experience of being connected with the investigation into the assassination of Abraham Lincoln. He was an apprentice in a St. James Street drug store at the time.

It will be remembered that when Booth, Lincoln's murderer, was arrested, he had among his possessions a box of pills with the Montreal Medical Hall inscription on it. Dr. Gurd was questioned by a detective regarding these pills—who had made them, and who had ordered them. The pills had been made by a Dr. Palen, a refugee from the south, who resided next to the St. Lawrence Hall, where many of the southern refugees lived, some with large priees on their heads, one of whom was a Dr. Blackburn, who was alleged to have sent yellow fever-infested clothes to soldiers.

Other incidents recalled by the doctor included the St. Albans' raids, the shooting of Thomas Lett Hackett, the Fenian Rebellion and the sensational "Doutre law" fight arising out of the Roman Catholic church's refusal to have anything to do with the burial of a Frenchman named Guibord, who was alleged to have been connected with an anti-church association. At that early date Dr. Gurd was quoted to the effect that "the world has progressed so wonderfully in my time, and Montreal has so

marvelously widened and improved itself that it seems strange to think that we once had to rely on candles for our light. I well remember the time when a coal-oil lamp was considered a luxury."

Lieutenant-Colonel Gerald Ross Burns, M.D., officer in charge of medicine, No. 7 Canadian General Hospital, A.F., died on November 16, 1941. Death followed the perforation of a duodenal ulcer eight days before, and bronchopneumonia.

Lieutenant-Colonel Burns graduated in medicine from Dalhousie in 1925. After graduation he served as assistant superintendent of the Nova Scotia Sanatorium and later carried out post-graduate studies in internal medicine at the University of Pennsylvania.

In 1929 Dr. Burns returned to Halifax where he opened an office. His appointment as assistant attending physician at the Victoria General Hospital followed. For a term he acted as chairman of the medical staff there. He was a president of the Halifax Infirmary Medical Staff and assistant professor of medicine at Dalhousie. He was a Fellow of the American College of Physicians.

At the outbreak of war Lieutenant Colonel Burns went on active service with his unit, the 22nd Field Ambulance. For a time he was Acting Officer Commanding at Cogswell Street Military Hospital in Halifax, where, through his efforts the Burns Annex was built and named in his honour. From there he transferred to No. 7 General Hospital, on its formation, as officer in charge of medicine.

Gerald Burns was a physician and a good Christian. His long, long strides and his ranging mind bore him over wide fields in the four decades that were given him. His measure lifetimes may be us would find in them scant opportunity to be worthily our mortal eye. To Gerald Burns

Medicine he lived with heart and it made him unique, acknowledged by confrères, as by his patients, with the big diagnosis him so much, broad truth, unburdened with clinical opinion, which were plain, deliberate simple. A new disease he met with happy with, as in earlier years a new toy disease he moved with proved medicine.

No little part of his life was given from his love of their confidences, understanding and because they were in laughter. With a dependable friend, in return for his, are given the whole remark he ever made, no better. He was like a philosopher, always the faults.

To appraise a man's life is a poor task for mortals. Through all the fields he passed, green, barren, rocky, Gerald Burns saw clearly a way of life. He could dispense his faith with logic and clear fact, for himself he left it unreasoned, because it had no need of reason. It was in itself complete, the means and the end. As he lived, so he died briefly, contently in perfect faith, and with a calm hope.

Dr. Anthony Hector Desloge

December 3, 1941 in his 65th year.

Born in Pembroke, Ontario, he received his course at St. Mary's College, and his medical studies at Laval University. He was admitted to the practice of medicine in 1914.

Made a member of the Légion d'Honneur in 1925, he was appointed to direct the Canadian National Committee for Mental Hygiene in the Province of Quebec in 1929.

It was in 1920 that he began his work against venereal disease in the Province of Quebec. For the last fourteen years he had been director of the electrotherapeutic department at the Hotel-Dieu.

**Dr. James Stanley Gardner**, aged 44, died at his residence in Norwood, Man., on November 25th after a week's illness. He was born in London, England, came to Winnipeg 17 years ago, and graduated in medicine from Manitoba Medical College in 1923. He practised in Winnipeg and St. Boniface from the time of his graduation.

**Dr. A. L. Gerow**, of Fredericton, died on December 1st at the age of fifty-four years. Dr. Gerow had been educated in the Public Schools of New Brunswick, at the University of New Brunswick and graduated in medicine from the Long-Island College Hospital in 1914. Dr. Gerow served in the Canadian Army Medical Corps during the First Great War and has practised in Fredericton since 1918. He was a past president of the New Brunswick Medical Society and had served for many years on the Council of the Canadian Medical Association representing New Brunswick. Dr. Gerow enjoyed a very large general practice and for many years has been known as an outstanding surgeon. He was well known in the Medical Society from Halifax to Vancouver and in many of the medical centres of the United States. "Alder" Gerow was known and loved for his gruff manner and great heart, and his hospitality was a word in his native province.

**Dr. John Graham**, of Brampton, Ont., died on December 6, 1941, at Christie Street Hospital, Toronto. Dr. Graham carried on a very active practice at Bolton for a number of years, and was keenly interested in the activities of organized medicine. He served as Counsellor of his District and on various provincial committees. He was honoured with Life Membership in the Ontario Medical Association, and Senior Membership in the Canadian Medical Association, in 1939.

**Dr. Robert Henry Macrae**, of Bury, Que., died on November 11, 1941. He was seventy-one years of age. A son of the late John Macrae and the former Mary Calvin, Dr. Macrae was born in Leeds, Eng., in 1871. He studied at Bishops College, Lennoxville, and graduated from the University School of Medicine in Montreal. After graduation he held a staff position at the Western Hospital for several years, and then, in 1906, came to Bury.

**Dr. James Stott McDiarmid**, of Ridgetown, Ont., died in the Victoria Hospital, London, on November 30th.

Dr. McDiarmid, who was in his 63rd year, was born in the Village of Highgate and graduated in medicine from McGill University in 1913. He practised in Ingersoll, Dover Centre, Woodstock, and Ridgetown.

**Dr. Robert Burns Mackay**, retired medical practitioner of Montreal, died in the Ross Memorial Pavilion of the Royal Victoria Hospital, November 15th. Dr. Mackay was 77 years old and was born in Toronto. He studied at the University of Toronto and McGill University, graduating in medicine from the latter (1893), and had made Montreal his chief place of residence for the past 48 years. He also lived at different times in Ottawa, Western Canada and other parts of Quebec. He retired 20 years ago.

**Dr. Paul S. McKibben** died suddenly in Los Angeles on November 11, 1941, following an abdominal operation. He came to the University of Western Ontario in 1912 as Professor of Anatomy, and was appointed Dean in 1917, a position which he held for ten years,

except for two years during the war. Dean McKibben was, to a great extent, responsible for the planning of the medical school and, during his Deanship, Western received a grade A standing.

**Dr. Henry A. McTaggart**, M.A., Ph.D., F.R.S.C., Professor of Physics, and on the staff of the University of Toronto for thirty years, died suddenly on November 12th. He had been ill for a week. Dr. McTaggart was born in Vancouver and graduated from the University of Toronto in 1907. He was not a graduate in medicine but, after post-graduate work in Cambridge, he joined the staff of No. 14 Canadian General Hospital as x-ray technician and served at Salonika. He was later transferred to the British Admiralty where he did research work in physics. He is survived by one brother.

**Dr. Robert Faulkner O'Brien**, of Halifax, died at the Victoria General Hospital, November 29, 1941. Death followed injuries sustained in an automobile accident. He was 74 years of age.

Born at Noel, Hants County, Dr. O'Brien was a son of Osmond O'Brien, builder of Nova Scotia's wooden ships in earlier years. After taking a Bachelor's degree in Science at Dalhousie, he graduated in medicine from the Jefferson Medical School. During his long career Dr. O'Brien practised at Windsor, Maitland, Elmsdale and, finally, at Halifax, where he served for many years, retiring ten years ago.

Surviving Dr. O'Brien are his daughter, his son Robert, and his son Major O'Brien, M.D., now serving with No. 7 Hospital unit, overseas.

**Dr. Henry Ernest Paul**, who served as a major with the Canadian Army Medical Corps in England and France during the first Great War, died on November 8th, at St. Joseph's Hospital, following a week's illness. He lived at 37 Rosehill Avenue.

For many years Dr. Paul was on the staffs of Christie Street and St. Joseph's Hospitals. Sixty-six years of age, he was born at Newburgh, Ont. He was a graduate of Queen's University (1901). Following post-graduate work in medicine and surgery in New York and Chicago, he established a practice in Fort William in 1903.

Dr. Paul went overseas in 1915 with the Canadian Medical Army Corps and was Officer Commanding of several hospitals in England. Later he was stationed at base hospitals and casualty clearing stations in France. Returning to Canada, he was attached to the army medical staff at Ottawa. He had been a member of the Christie Street Hospital staff since 1918.

He was a member of the American Urological Association, the Academy of Medicine.

**Dr. E. L. Steele**, of Akron, Ohio, died on August 2nd. Dr. Steele graduated from the University of Western Ontario in 1914, proceeding overseas where he served until 1918. After the war he was attached for several years to the Staff of the Westminster Military Hospital, London, Ontario. Later he moved to Ohio, where he practised until his death.

**Dr. Burpee F. Steeves** died in Calgary on October 24, 1941. He was born in New Brunswick, November 13, 1864, graduated from Dartmouth Medical College, Hanover, New Hampshire, in 1895, registered in New Brunswick and practised at Elgin, N.B. On August 12, 1905, he registered with the College of Physicians and Surgeons, Northwest Territories, and opened an office in Clarenholm, later moving to Clive, Alta., where he practised until going to the first Great War. Dr. Burpee lived in Calgary for several years following retirement from practice.

**Dr. Gerald A. Strapp** (McGill, 1926) formerly of Harbour Grace, Newfoundland, was found dead in his hotel room in Montreal on November 4, 1941. Death was due to a heart attack. He was in his 39th year.

Lately he was appointed Medical Officer to the Newfoundland Militia, and was in Montreal at the time on military medical duties.

In the death of Dr. J. Bain Thom, of Trail, which occurred on October 19, 1941, British Columbia has lost one of its outstanding citizens. Doctor Thom, for many years, was a member of the Trail-Rosland Clinic, later known as the C. S. Williams Clinic. He has filled many positions of honour and authority in that district, having been Coroner, Provincial Medical Officer, Mayor of Trail, President of the Trail Curling Club, Past Master of Fidelity Lodge A.F. and A.M., and honorary member of the local branch of the Canadian Legion.

He has served the profession as a whole long and well, having been on the Board of Directors of the British Columbia Medical Association, and on the Council of the College of Physicians and Surgeons. Of the highest character and of marked ability as a doctor, Doctor Thom has long been one of the best citizens of British Columbia.

**Dr. Charles Ashton Webster** died at his home in Yarmouth, Nova Scotia, November 23, 1941. He was 77 years of age, and widely known through the province.

It was in 1886 that Dr. Webster graduated from the College of Physicians and Surgeons in New York. For 55 years he practised his profession and many indeed have been his services to the people of Yarmouth. These extended beyond the broad sphere of medicine; he was an active member of the Yarmouth Board of Trade, of the Agricultural Society, the Hospital Society and other groups working for the common good. Dr. Webster was a senior member of the Canadian Medical Association and one of the first Fellows of the American College of Surgeons. His son, Dr. John Alexander Webster, carries on his medical work in Yarmouth.

## News Items

### Alberta

The annual elections are being held in Districts: No. 1, Medicine Hat, candidates, Dr. W. G. Anderson, Wardlow; Dr. S. F. McEwen, Medicine Hat. No. 3, Banff-Red Deer, Dr. R. Parsons, Red Deer. No. 5, Peace River, Dr. A. E. Archer, Lamont. No. 7, Edmonton, Dr. T. H. Field, and Dr. W. A. Wilson, Edmonton.

As in Districts No. 3 and No. 5, each had only one candidate, Dr. Parsons and Dr. A. E. Archer were elected by acclamation and thus succeed themselves.

It is with deep regret we have to chronicle the fact that Dr. L. C. Conn, Professor of Obstetrics and Gynaecology, at Alberta University, Edmonton, is very seriously ill.

A report has reached Calgary that Dr. F. W. McManus, formerly of Bashaw, but lately of Idaho has been killed in a motor accident.

The physicians of Alberta have been sending in large numbers of instruments to the Red Cross for the benefit of the medical men in his majesty's forces.

The Council of the College of Physicians and Surgeons of Alberta met in Edmonton recently, and interviewed the Minister of Health and the Workmen's Compensation Board. There were no great issues at stake, but it was felt that frequent meeting with the officers of the Department tends for better understanding and more harmony. The Council members were well received.

There are now nine Health Units in Alberta and three others in contemplation. The headquarters of the Units are as follows: High River, Didsbury, Red Deer, Stettler,

Lamont, Legal, Holden, Clover Bar (in Edmonton), Two Hills.

Considerable agitation over the use of the "Koch Cure" was brought to the attention of the Minister of Health. He asked the Cancer Commission to investigate the cases at Taber and though the commission has made no report from the evidence in the press, it would appear that the persons claiming benefit brought no scientific proof that they had the disease of which they claimed to have been cured. It is reported that the Government is willing to have some definite tests properly made and recorded, if patients demand it and are willing to assume all risks. The tests are to be made entirely without cost or expense to the patients.

Owing to the War, many men have left their rural districts and joined up, so that at the present time many formerly occupied medical fields are without medical practitioners. While the weather remains good the situation may be met reasonably well, but with winter roads, some sick persons will suffer. G. E. LEARMONT

### British Columbia

On Wednesday, November 26th a largely attended luncheon was held in the Hotel Georgia when Brigadier R. M. Gorssline, Director General of Medical Services, was the guest speaker, and outlined the services which had been developed, and were to be extended, for the care of the Forces.

In commenting upon the splendid response of the profession and the co-operation of organized Medicine through the Canadian Medical Association and the Provincial Associations, Brigadier Gorssline stressed the fact that more medical officers were needed to maintain a good medical service, the standard of which would be of a very high order. He announced that a general hospital would be formed in British Columbia and in fact is in process of formation at this time.

Brigadier Gorssline told of the number of men who were at present engaged in the medical services for the Navy, the Army, and the Air Force. In defining the needs of the Army, he pointed out that what was required was that callibre of medical man who could carry on as a good sound general practitioner among the men.

The hospitals of the British Columbia coastal area are beginning to realize what war conditions mean. The first night of the blackout on December 8th found us completely unprepared. Day staffs were summoned to be in readiness and temporary expedients for blackout windows, etc., had to be resorted to. On the whole, however, the natural ingenuity and resolution of those concerned surmounted most of the difficulties. Some men who were engaged in procuring blood from donors for the Red Cross scheme, which provides plasma for Overseas use, had troubles of their own owing to the lighting difficulties. These were not relieved by the appearance of the janitor of the building, white-faced, and shaking, who announced that planes and aircraft carriers were at present off Nanaimo, some forty miles from Vancouver. The report turned out, however, to be grossly exaggerated.

The following members were appointed to the Executive Committee of the British Columbia Medical Association: Doctors Murray Blair, W. A. Clarke, G. O. Matthews, H. H. Milburn, G. F. Strong, Wallace Wilson, A. H. Spohn, Chairman, A. Y. McNair, Honorary Secretary and M. W. Thomas, Executive Secretary.

The Committee on Maternal Welfare of the British Columbia Medical Association has prepared a maternal record card for use by the profession. This is now ready for distribution by the Provincial Board of Health and marks an advance in our method for improvement of maternity statistics.

The Board of Health is also distributing to all doctors in the Province, a short form for reporting cases of

cancer in British Columbia, and asking for the co-operation of all medical men.

The Annual Meeting of the West Kootenay Medical Association was held in Trail on October 8, 1941. A clinical session was held in the hospital, and lectures were given by Doctors C. M. W. Anderson, J. M. Nelson and R. D. Reckie of Spokane. Those present met at dinner later at the hotel. After dinner the following were elected as officers: Honorary President—Dr. J. Bain Thom, President—Dr. Arnold Francis of New Denver, Vice-president—Dr. H. F. Tyreman of Nakusp, Honorary Secretary—Dr. Wilfrid Laishley of Nelson.

The Annual Dinner of the Vancouver Medical Association was held on November 20th, in the Hotel Vancouver. One hundred and twenty-six members were present and the programme of entertainment provided by those in charge proved highly successful. The degree of Prince of Good Fellows was conferred upon Dr. C. F. Covernton, whose choice proved extremely popular with the meeting. Doctor Covernton has been in practice in Vancouver for over thirty years and there is no member of the profession more sincerely liked and respected.

J. H. MACDERMOT

### Manitoba

Dr. James M. Macintosh, professor of public health in Glasgow University, who was chief medical officer for Scotland in 1937-41, arrived in Winnipeg November 26th to make a study of advances made in public health teaching and full-time municipal medical health units in this province. Dr. Macintosh is making his studies on this continent under the auspices of the Rockefeller Foundation. He addressed the students of the Manitoba Medical College on November 27th.

Lt. Col. R. P. Wright, R.C.A.M.C., of Montreal, has assumed command of the Fort Osborne Military Hospital, Winnipeg, in succession to Lt.-Col. T. E. Holland who has gone overseas. Major John Hillsman, R.C.A.M.C., is second in command.

Dr. F. G. McGuinness has been appointed chairman of the Manitoba Military Advisory Committee succeeding Dr. W. E. Campbell who has resigned.

By unanimous vote the Woman's Club of Winnipeg on December 8th passed a resolution asking that the provincial government pass a new marriage act requiring a physical and mental examination of man and woman before a marriage licence is issued.

The resolution followed a talk by Dr. F. W. Jackson, Deputy Minister of Health and Public Welfare. He advocated a six-point program for better health:

1. Only fit persons should be allowed to become parents.
2. There should be complete supervision of pregnancy and the newborn from birth to school age.
3. A certificate of fitness should be required before a child enters school.
4. An effective school nursing and dental program should be instituted not only in Winnipeg but in rural points.
5. An efficient program of health education should be brought about by radio, press and lecture instruction.
6. Adequate medical service should be available to all, including periodic health examinations.

"With such a program", said Dr. Jackson, "we could reduce unnecessary expense in our welfare service by 50 per cent. Under such a program illness as a cause of social insecurity would disappear."

Surgeon Rear Admiral Gordon Gordon-Taylor, R.N., now connected with civilian casualties medical services in England, spent a busy day in Winnipeg, December 8th, leaving the following day. He was the guest of Dr. Gordon Fahrni, President of the Canadian Medical

Association. Admiral Gordon-Taylor addressed the medical students at 11 a.m.; was the guest of President Sidney Smith of the University of Manitoba at a luncheon at Manitoba Club; a dinner guest of the Winnipeg Surgeons' Club, and then spoke to the Winnipeg Medical Society in the evening. His subject on that occasion was "Surgical aspects of modern warfare".

Ross MITCHELL

### New Brunswick

Dr. H. A. Farris, of Saint John, N.B., who has been in indifferent health for some time is at present in Montreal for surgical treatment.

Dr. J. P. Richard, of Edmundston, suffered a fracture of his thigh recently, the accident resulting due to icy conditions of the roads.

On invitation of the Moncton Medical Association, Dr. A. S. Kirkland, of Saint John, attended their monthly meeting and talked of the "Clinical care and x-ray therapy of cancer patients".

The New Brunswick Council of Physicians and Surgeons, at the fall meeting implemented a resolution of the New Brunswick Medical Society increasing the registered fee from seven to ten dollars per annum.

A. STANLEY KIRKLAND

### Ontario

St. Joseph's Hospital, Sudbury, with its St. Elizabeth School of Nursing, has recently opened a new residence in the Annex, on the east side of the Hospital.

Fire caused a \$75,000 loss on November 6th in the destruction of the Hospital at Camp Borden. The hospital was made up of some fifteen one-storey buildings. Patients were taken from the building at the first alarm and were made as comfortable as possible in the grounds near by. Barrie's fire fighting equipment was rushed to the Camp. This big hospital was completed and opened only last spring and contained 600 beds making it perhaps the largest military hospital in Canada. Among the first buildings destroyed were those containing x-ray equipment and medical supplies and the Orderly Room. The fire has been attributed to defective wiring. Fortunately there was no loss of life.

Subject to the approval of the City Council and the securing of a priorities license from the Federal Government, the Board of Control has authorized the Hamilton Hospital Board of Governors to proceed with plans for the construction of a nurses' residence on Barton Street. The proposal was authorized providing the project does not exceed a cost of \$44,000.

The Board of Governors of the Hamilton Hospital Board has endorsed the principle of the establishment of an advance course in nursing by McMaster University in collaboration with the Hamilton General Hospital. The proposition has the approval of the Medical Board's Committee on Affiliation between the hospital training school for nurses and McMaster University.

A number of municipalities in Ontario will be interested in the action of the Frontenac County Council in securing legal advice as to whether the county or the municipalities should prosecute persons who are able, but unwilling, to pay their hospital bills.

The Physiotherapy Department at the Brantford General Hospital has been organized and is now operating.

Following the example of St. Joseph's Island Townships, six townships on the Algoma mainland have decided to group themselves together to employ a resident physician who in turn for salary contributed by

the townships, will look after the health of the residents. The Townships concerned are: McDonald, Meredith, Aberdeen, Laird, Tarbutt, and Johnson, and the move is being made under the sponsorship of the Red Cross Society.

It is announced that the Ontario Government's Division of Tuberculosis Prevention will undertake a survey of civil servants. It is hoped that this will be the beginning of a long-term plan drafted by the Department of Health to make extensive tuberculosis surveys in industry and in other sections of the population. The x-ray facilities of the Department of Health will be used for this programme, which is not only for the protection and welfare of the civil servants concerned, but will be an example and encouragement to industry to exercise the same precaution in protection of employees.

The town of Weston has undertaken the construction of a new incinerator which will be completed by the end of January at a cost of about \$20,000. This will handle approximately fifteen tons per eight-hour day, and should care for the municipality's needs at the present rate of growth for the next twenty-five or thirty years.

The Registrar of the College of Physicians and Surgeons of Ontario has made public that only fifteen foreign born doctors have sought the right to practise in Ontario since the war began. Six of these have passed the examinations of the Medical Council of Canada and are now practising here. The others are interning in the hospitals in preparation for registration. The American Medical Association states that 1,500 foreign physicians have been driven to the United States by Europe's dictators.

**The Harben Lectures.**—Dr. E. V. McCollum, Ph.D., Sc.F., LL.D., Professor of Biochemistry, School of Hygiene and Public Health of the Johns Hopkins University, accepted last year the invitation of the Royal Institute of Public Health and Hygiene of London, England, to deliver the Harben Lectures for the year 1941. Owing to war conditions, it was considered not desirable to have these delivered in London. Arrangements were made with the University of Toronto for the delivery of the lectures and these were given in Convocation Hall to large audiences on the evenings of December 1st, 2nd, and 3rd. The group of lectures, under the general title—"Nutritional Science and Public Health", were as follows: Monday, December 1st: Inorganic elements which present nutrition problems of practical importance. Tuesday, December 2nd: Problems presented by the availability of low-cost synthetic vitamins—enrichment, fortification and restoration of refined foods. Wednesday, December 3rd: Nutrition problems presented by low-income families.

The University of Toronto conferred the Honorary Degree of LL.D. upon Surgeon Rear-Admiral Gordon Gordon-Taylor, Senior Vice-President of the Royal College of Surgeons of England and Consulting Surgeon to the Royal Navy in a special ceremony at Convocation Hall on November 28th. At the conclusion of convocation, Rear-Admiral Gordon-Taylor depicted, with the aid of lantern slides, recent advances in the treatment of wounds, burns, and shock relative to the present war. He dealt with gas gangrene, tetanus, secondary haemorrhages, abdomino-thoracic wounds, and, in the course of the lecture, threw on the screen a photograph of a spleen that had been removed from the abdomen of Major General Gordon Pearkes, V.C., during the last war. He remarked that, though this is one of the most serious of abdominal wounds, yet, after its removal, Major General Pearkes not only went on fighting, but won the V.C., and is overseas again in the present war.

At a later meeting, the Admiral was able to meet Colonel Cosbie who gave General Pearkes early treatment in the ambulance on the field. The Admiral also portrayed the destruction caused by bombs to the Royal

College of Surgeons' buildings, and pictured the serious damage done to the Hunterian collection.

Dr. J. F. McCreary of the Hospital for Sick Children and the University of Toronto, addressed a large public meeting at the Central Technical School on December 11th on the subject of nutrition, dealing with the important matter of food and vitamins. This was a lecture sponsored by the Health League of Canada.

At a meeting of the Medical Alumnae of the University of Toronto, the following officers were elected for 1941-42: Honorary President, Dr. Margaret Johnston; President, Dr. Marion Kerr; Vice-Presidents, Dr. Eleanor Robinson, Dr. Isabel Ayer, Dr. Elizabeth Young; Out of Town Presidents, Dr. Ruth Bradley, Dr. Agnes Jamieson, Dr. Helen Doane; Corresponding Secretary, Dr. Jessie Gray; Recording Secretary, Dr. Agnes Bellman; Treasurer, Dr. Fran Stewart.

Dr. W. C. McGuire of Ripley has won the F.R.C.S. (Edinburgh).

Wing Commander A. D. Kelly, Executive Secretary of the Ontario Division, is now overseas and may be addressed—Medical Branch, R.C.A.F. Headquarters, 2 Cockspar Street, London, S.W.1, England.

The appointment of Group Captain J. W. Tice as Deputy Director of Medical Services for the R.C.A.F., has been announced. Air Commodore R. W. Ryan is Director.

Major J. H. Ryan of Winnipeg, who returned from England in October after many months of service with Canadian Troops, has been posted to the Hamilton Military Hospital in charge of surgery.

Lt.-Col. Hugh Roy Mustard, M.C., of Vancouver, has been appointed Commanding Officer of Chorley Park Convalescent Hospital, relieving Lt.-Col. D. A. Warren, who will continue to command the Toronto Military Hospital.

Dr. Doris Howell, a graduate of the University of Toronto 1926, is now in Leeds, England, where she is attached to the emergency service under the British Ministry of Health. She has been granted leave of absence from the Central Laboratory of the Department of Health of Ontario where, for three years, she has been engaged in pathological and bacteriological work. Her address is Regional Transfusion Service, School of Medicine, Leeds, England.

Lloyd Hession, of London, has been promoted to the rank of Wing Commander. For some time Chief M.O. at Camp Borden, he is now serving overseas.

Captain K. Bell, R.C.A.M.C., of Sarnia, has been in England since last spring.

Sub. Lt. Rowe Fry, R.C.N., of St. Thomas, for some time stationed at Halifax, is now at sea.

Flt. Lt. Ray Lawson is in England with the R.C.A.F. Surgeon Lt. Albert M. Pain, of Hamilton, is with the R.C.N.

Col. E. G. Davis, C.M.G., Deputy Director of Medical Services for the Department of National Defence, Ottawa, has been elected an honorary member of the Association of Military Surgeons of the United States.

Dr. Olive Stewart, who had the honour of being the first M.O. of W.A.A.F., with the rank of Section Leader, has been stationed at Havergal College Training School, Toronto.

**Class '23, University of Western Ontario.**—Capt. Ross Dongall, of Petrolia, is with the R.C.A.M.C. at Chatham, Ont. Col. Earl Hunter, of London, is with the R.C.A.M.C. overseas. Major Art James, R.C.A.M.C., was in Iceland recently. Capt. T. Roy McLeod, of the Muncey Indian Reserve, has been transferred from

the Woodstock Military Hospital to the 15th Field Ambulance Corps, Valcartier, Que.

*Class of '31.*—The R.C.A.M.C. has claimed a number of Class of '31. Capt. R. Bowen of Lambeth; Capt. Wm. Johnston at the London Military Hospital; Capt. Walter Middleton, of the Queen Alexandra Sanatorium, Byron, who is with the 15th Field Ambulance; Capt. H. C. Moorhouse of the Ontario Hospital, Brockville, and Major Jack Wells of Orillia.

*Class of '25.*—Capt. J. D. Balfour, R.C.A.M.C., formerly of the Banting Institute, Toronto, is stationed at Wolseley Barracks, London. Capt. Jack Jose, of St. Mary's, is with the R.C.A.M.C. at Stratford. Capt. Reg. Wride, of the R.C.A.M.C., is stationed at the Esquimalt Military Hospital, Victoria, B.C.

*Class of '27.*—Lieut. Hugh McColl of Petrolia is with the R.C.A.M.C.

*Class of '10.*—Dr. George Ramsay, Professor of Orthopaedic Surgery at the Medical School, has been named medical officer of the new London Squadron of Air Cadets.

*Class of '17.*—Capt. W. L. Denney, of London, is stationed at Wolseley Barracks, London.

*Class of '26.*—Capt. John Sifton of Galt is with the R.C.A.M.C.

*Class of '34.*—Flt.-Lt. C. C. Lee of Langton, Ontario, is stationed at Boundry Bay, B.C. Capt. F. J. Milner, of the Niagara Peninsula Sanatorium, St. Catharines, is enjoying army life as M.O. of the Toronto Scottish Regiment in England. He has been overseas for 15 months. Surgeon Lieut. Stewart Ward has returned to Naval Headquarters, London, after some very interesting experiences at sea.

*Class of '40.*—Flt.-Lt. Harold Kester is stationed at Winnipeg. Surgeon Lieut. John A. McLachlin, of the R.C.N., is on loan to the British Navy. Lieut. Wm. Needham of the R.C.A.M.C., is stationed at Wolseley Barracks, London. Flt.-Lt. Eric Webb is at present at the R.C.A.F. Recruiting Headquarters, London. Lieut. B. C. Brown of London and Lieut. Jas. Galloway of St. Thomas, members of the R.C.A.M.C., are at present stationed at Camp Borden.

*Class of '32.*—Capt. Paul Hauch, of the R.C.A.M.C., of Preston, is at Victoria Hospital doing some post-graduate work in x-ray. Dr. Thos. Kearns of Bothwell is with the R.C.A.M.C. Surgeon Lieut. Neil McArthur is with the R.C.N. Capt. M. L. Booth of Wallaceburg is with the 15th Field Ambulance. Capt. E. G. Kennedy of Belleville is commanding officer of the 2nd Canadian Medical Centre Hospital, England.

*Class of '30.*—Capt. Angus Black of Aylmer and Capt. Henry Poco of Wallaceburg are now with the R.C.A.M.C. Capt. Ken Bice, R.C.A.M.C., of London, is now overseas. Major Kenneth Hunter of Vancouver is now with a Canadian hospital overseas. Squadron Leader Jack Sharpe, R.C.A.F., inspector of Mental Hospitals, Toronto, is now Deputy Principal M.O. for Eastern Canada.

*Class of '12.*—Major W. C. Morgan of Belleville has been transferred from the staff of the Brockville Military Hospital to the Rideau Military Hospital, Ottawa.

*Class of '35.*—Dr. Murray Barr is with the R.C.A.F.; also Flt.-Lt. Roger Jackson of Hamilton. Capt. Archie Hammond and Capt. A. D. Riddell of Brantford is with the R.C.A.M.C. Capt. S. Valeriote of the R.C.A.M.C., of Guelph, is with the 15th Field Ambulance. Major Everett Ainslee is enjoying the work at the No. 1 Neurological Hospital "Somewhere in England".

*Class of '38.*—Sub-Lieut. W. Elgin Crysler of Simcoe, R.C.N., is stationed at Victoria, B.C. Squadron Leader John Jay, is senior M.O. at Claresholm, Alberta. Flt.-Lt. Don McDonald of Ingersoll is at R.C.A.F., Victoria, Que.

*Class of '22.*—Wing Commander S. G. Chalk is stationed in Toronto with No. 1 Air Training Command. Lt.-Col. W. E. Mace is O.C. of the 15th Field Ambulance Corps.

Major T. G. Heaton sends the following items from Halifax:

Lt. W. B. Phair, Toronto, has recently been stationed in Military District No. 6 in the Halifax area.

Col. H. P. Hamilton is now District Medical Officer, M.D. No. 6, Halifax. He was formerly in practise in Guelph, Ontario.

The Halifax Medical Society has invited all medical officers in the Services about Halifax to attend their meetings, and this privilege is being much used and appreciated. Medical Officers, too, find a warm welcome at the Medical Library of Dalhousie University.

On November 12th the Halifax Medical Society decided, on motion of Dr. Atlee, to collect a monthly subscription from every member of the local profession in order to provide a fund from which to supply the needs of Nova Scotia Medical units overseas. Academy of Medicine, Toronto, please note!

Major E. C. Janes, formerly of Hamilton, Ontario, is now O. i/c. Surgical Service at Halifax Military Hospital.

Lt. Ken. Moir, formerly of Toronto, is attached to No. 6 District Depot at Halifax. J. H. ELLIOTT

## Quebec

Deux thèses d'agrégation ont été soutenues à la faculté de médecine de l'Université de Montréal. Le 18 novembre, le Dr René Bolté: "Les faiseaux teneurs des apénèroses" (agrégation en anatomie normale); le 24 novembre, le Dr Rosario Fontaine: "Ballistique médico-légale" (agrégation en médecine légale).

"Au cours du mois de septembre dernier, les officiers du département de la Santé et du Bien-Etre social ne firent pas moins de 8,038 inspections sanitaires, confisquant par la même occasion, 7,247 livres d'aliments impropre à l'alimentation." Ces paroles de l'Hon. Henri Groulx démontrent que les inspections sanitaires atteignent leur but. Au cours de septembre les inspecteurs sanitaires ont visité 265 logements, 174 établissements de coiffure, 645 écoles, 672 laiteries, 441 vacheries, 338 abattoirs, 671 marchés publics et 2,452 autres établissements de victuailles.

Nous ne saurions trop répéter que le Ministère de la Santé offre gratuitement aux médecins qui en font la demande les médicaments nécessaires pour le traitement de la syphilis. Ceux qui n'auraient pas reçu leurs formules pourront en obtenir en s'adressant au Directeur de la Division des maladies vénériennes, 89 Est rue Notre-Dame, Montréal. JEAN SAUCIER

**A Hearing Aids Bureau.**—There has always been a definite need for expert advice in the choice of aids to hearing. It is true that there are many excellent types of this apparatus on the market, but what suits one individual may not suit another, and it is often necessary that several different makes be tried out before a suitable one is found. Not enough is yet known to permit of simple prescription by the otologist of a particular aid.

It need hardly be mentioned also that all hearing aids are not equally good. This is an additional reason for guidance in choosing between them.

We learn that recently steps have been taken in Montreal to set up a Hearing Aids Bureau which will fill this very present need. Bureaus of this nature have been in operation for some time in New York, Boston, Philadelphia, Chicago and Toronto, being operated through the League for the Hard of Hearing in these cities. The new venture has been developed under the auspices of the Otolaryngological Section of the Montreal Medico-Chirurgical Society, in association with the local League for the Hard of Hearing and La Société Médicale de Montréal. At this bureau the various hearing aids approved by the Council on Physical Therapy of the American Medical Association, are on display and may be tried out by any patient recommended by his ear specialist. A carefully trained directress is in charge of the bureau. She is bilingual and her training has included the



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testing of hearing losses, the psychology of the deafened and the fitting of hearing aids. She has also been allowed to spend a considerable time in the factories where these instruments are made. Under her supervision the patient selects the instrument most suitable for his needs and will then be advised to procure it from the dealer in his neighbourhood.

There is no endowment of this bureau, as is the case in other centres, and a moderate fee is to be charged until it can become self-supporting. We feel sure that the value of its work is self-evident and desire to draw attention to its establishment. It is noteworthy that the doctors interested in the formation of this bureau represent both the English and French speaking doctors of the Province of Quebec, as well as others from the bordering provinces.

The Hearing Aids Bureau does not sell hearing aids. It hopes to co-operate with the dealers in the districts from which the patients come. The dealers themselves have given their full support and have generously supplied the instruments on display.

The promotion of four Montreal dentists serving in the Canadian Dental Corps overseas to the rank of major was announced here today. The officers are Major Victor Jekill, Major E. T. Bourke, Major Gerald Franklin and Major J. P. Lantier.

A member of the 9th Field Ambulance before the war, Major Bourke went overseas with that unit as dental officer in December, 1939. He is a past president of the Montreal Dental Club, a vice-president of the Canadian Dental Society and a former lecturer at McGill University.

A veteran of the Great War, Major Jekill was formerly attached to the Canadian Dental Corps' headquarters staff at Ottawa. He went overseas with No. 1 Neurological Hospital in June, 1940. Prior to the war he was a former staff consultant at the Royal Victoria Hospital.

Major Lantier is also a veteran of the Great War and went overseas with the First Divisional Dental Company in December, 1939. He was a former director of clinical dentistry at the University of Montreal and a past president of La Société Dentaire de Montréal.

A member of the teaching staff at McGill University, Major Franklin went overseas in December, 1939, with Canadian Dental Corps headquarters and was later attached to No. 1 Neurological Hospital.

Lt.-Col. R. H. McGibbon, E.D., district medical officer for M.D. 4, has been promoted to the rank of full colonel, according to today's routine orders. A veteran of the Great War, Col. McGibbon has two sons serving in this war. One of them, Lt. Robert L. McGibbon, who served with the 2nd Battalion, Leicestershire Regiment of the Imperial Army, is a prisoner of war in Germany. The other son is Sub-Lt. Gordon McGibbon, an engineer officer of the R.C.N.V.R., who is serving with the Royal Navy.

For the first time the American Society of Anæsthetists has elected a Canadian as its president. Dr. Bourne, chief anæsthetist at St. Mary's Hospital and consultant anæsthetist at the Royal Victoria, Montreal General, Children's Memorial and Shriners' Hospitals, was notified last night that he had been nominated to the office. The organization is affiliated to the American Medical Association and is the leading one of its kind. Dr. Bourne is lecturer in anaesthesia, Department of Pharmacology, McGill University. He graduated from McGill in 1911 and won the first Hickman Medal of the Royal Society of Medicine in England in 1935.

### Saskatchewan

Far from the crash of bursting bombs, the screaming of sirens and the din of a city under an air raid, Saskatchewan people have escaped the over-wrought nerves which has afflicted some in European countries.

The health of the people in Saskatchewan was never better, according to public health authorities of the province.

Out here on the western plains, people have not had to undergo the strain that people do who live under the constant threat of violence. There has been no increase in nervous diseases due to the war, according to Hon. J. M. Uhrich, M.D., minister of public health.

Tuberculosis, which experts say has a tendency to increase during war time, has not shown any increase up to the present time. The picture is just the same as far as that disease is concerned.

The recent epidemics of encephalomyelitis and poliomyelitis, severe in specific districts of the province, apparently, are not attributable in any way to the war, according to Dr. Uhrich.

Venereal diseases and illegitimacy have not increased. In fact, as a whole the incidence of these is down, although they may be up in some centres.

People today are eating the same things they did before, for there have been no restrictions. In fact, they may be eating better than they did, for there are more people working for wages and fewer people on relief than there have been for many years.

With reference to the general health of the province, Dr. Uhrich quoted from *The Medical Officer*, a health journal published in England. This paper, referring to Saskatchewan, said: "Saskatchewan can claim to be the healthiest country in the world". In 1939 its death rate was 6.4. This is the lowest in the history of the province, and the lowest in Canada.

The Journal then quotes the death rates for such diseases as tuberculosis, cancer, heart disease, pneumonia, nephritis and says: "All these rates were the lowest in all Canada and indeed the lowest in any community for which records are available. The cancer index was the highest recorded for the province, but it was less than half that of England and not much more than half that of British Columbia."

The Saskatchewan Anti-Tuberculosis League examined 4,000 students in Regina attending Normal School, Campion College, Balfour Technical School, Scott Collegiate, Luther College, Central Collegiate and Regina College.

No student objected to the x-ray examination which was done with the new machine developed by the League. All x-rays were free.

This is part of the preventive program of the League. The cases where the miniature x-ray film showed any suspicion of tuberculosis were given a re-examination and a large x-ray of the chest was taken.

No active cases of tuberculosis were discovered, but five students will be periodically checked by League physicians.

The Saskatchewan tuberculosis death rate was 17 per 100,000 in 1939. The infection rate among school children as determined by the tuberculin skin test has fallen from 51 per cent in 1921 to 7 per cent in 1939.

Dr. J. B. Ritchie spoke on "Some impressions of the International Post-Graduate Medical and Surgical Congress" at the regular monthly meeting of the Regina and District Medical Society on November 28th. The transient relief medical problem was also discussed.

Dr. John Orr spoke on "Erythema nodosum" at the December staff luncheon of the Regina General Hospital. He described cases in which the first symptoms of tuberculosis were erythema nodosum. This was observed often in nursing and medical personnel of sanatoria who began work at the sanatorium with a negative tuberculin test. He cited the history of a nurse in training who became ill with erythema nodosum at the Toronto Western Hospital in February, 1940, and died of tuberculosis in July of the same year at her home in Saskatchewan. She had entered training with a negative tuberculin test.



## MEDICINE, *too, had its heroic days*

THE "gilded-cage" of ten to twenty bedrooms, with but a single small, ill-ventilated "water-closet," held many a martyr to constipation or its alternative of the mid-Victorian era: Grandma's nauseating brews, or the doctor's unrefined castor oil or calomel.

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Not all erythema nodosum is due to tuberculosis. It seems often to be associated with a streptococcus infection.

Dr. M. A. Currie, Regina, has joined the Royal Canadian Navy with the rank of Surgeon-Lieutenant. He is at present stationed at Esquimault.

Dr. Marion Powell, Moose Jaw, is attending a four months' course in anaesthesia at McGill University, Montreal. Dr. Powell will resume her practice on January 1, 1942.

The following members have been elected by acclamation to the Councils in Medical Electoral Divisions numbers 1, 3, 5, 7, and 9. Drs. R. W. Kirkby, Prince Albert; J. A. Valens, Saskatoon; O. M. Irwin, Swift Current; U. J. Gareau, Regina; A. C. Scott, Indian Head.

Flt. Lt. J. D. Colquhoun of No. 11 S.F.T.S., R.C.A.F., at Yorkton, gave a very interesting talk on "Air Force medicine" at the meeting of the North-Eastern district medical society held at Yorkton. Dr. A. P. McKinnon of the McKinnon Orthopaedic Clinic at Winnipeg, also gave a very concise presentation of the subject of "Hip joint disease" with the particular reference to the age at onset as a factor in diagnosis.

Dr. U. J. Gareau, of Regina, has been elected by acclamation as member of council in medical electoral division number 7.

Flight-Lieutenant Gilbert Adamson, formerly of Winnipeg, addressed the Regina and District Medical Society on "Disorders of the menopause".

LILLIAN A. CHASE

### General

The President of the Royal College of Surgeons, Sir Alfred Webb-Johnson gave a luncheon party on October 9th at Claridge's. The company included members of the Council and officers of the College; the Presidents of the Royal College of Physicians and the Royal College of Obstetricians and Gynaecologists; the Medical Directors-General of the Services; and Viscount Dawson of Penn and Lord Horder. Among the many distinguished guests were the President of the Czechoslovak Republic, the Soviet Ambassador, the Egyptian Ambassador, and the Czechoslovak Minister of the Interior and Education; the First Lord of the Admiralty and the Minister of Health; the High Commissioners for Canada, Australia, New Zealand and South Africa. Canada was represented by Brigadier J. A. Linton, D.M.S., Canadian Forces, and Wing Commander A. R. Tilley, R.C.A.F.

The American Urological Association offers an annual award "not to exceed \$500.00" for an essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and if the Committee on Scientific Research deem none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years.

Essays shall be in the hands of the Secretary, Dr. Clyde L. Deming, 789 Howard Avenue, New Haven, Conn., on or before April 1, 1942.

Dr. Joseph F. McCarthy, Director of the Department of Urology of the New York Polyclinic Medical School and Hospital, received an unusual honour recently when a new wing in the Barros Luco Hospital, Santiago, Chile, was named for him. The entire cost of construction of the wing and equipment was covered by an endowment by Abraham Atala, a Syrian merchant. Dr. Edward Abud, a Syro-Chilean pupil of Dr. McCarthy, presided, and the ceremony was attended by President Pedro Aguirre Cerda and Claude

E. Bowers, American Ambassador, who said he felt the entire American medical profession has been honoured.

The nineteenth annual meeting of the American Orthopsychiatric Association, an organization for the study and treatment of behaviour and its disorders, will be held at the Hotel Statler, Detroit, Michigan, on February 19-21, 1942. Copies of the preliminary program will be sent upon request. A registration fee will be charged for non-members.

The arrangements for the Second American Congress on Obstetrics and Gynaecology to be held in St. Louis, Missouri, from April 6 to 10, 1942, are progressing favourably. Communications regarding the program should be addressed to Dr. Wm. F. Mengert, University Hospitals, Iowa City, Ia.

### Book Reviews

*Treatment of Infantile Paralysis in the Acute Stage.*  
E. Kenny. 285 pp., illust. \$3.50. Bruce Pub. Co., Saint Paul, Minn., 1941.

Sister Kenny deserves a great deal of credit for her work, in which she has persisted for many years in the face of continued apathy and discouragement. Her book deals with these difficulties and explains her method of treatment of this crippling disease. She publishes, for the first time, her entirely new conceptions of the symptoms produced, as well as her methods of treatment, which are diametrically opposed to our present orthodox principles. Her thesis is that continuing disability in infantile paralysis is due not to the flaccidity of affected muscles but to spasm of opposed muscles. While many of her contentions are startling, her work deserves thorough consideration and clinical investigation. This is being carried out at the present time in the United States and elsewhere. Further reports of these trials will be eagerly awaited, but in the absence of an epidemic, convincing scientific evidence is difficult to obtain quickly. The title of this book is somewhat misleading in that the treatment is of the symptoms and their sequelæ, and not of the disease itself. One cannot help wishing that most or all of the controversial matter had been omitted. The publication of doctors' opinions and the report of the Royal Commission, has lead to a lot of repetition; and part of the book is in the form of lectures delivered which adds little new matter. Miss Kenny repeatedly asserts that various things are "proved". However, from a scientific viewpoint one is constrained to suggest that additional controlled investigation is to be desired. This work should certainly cause the profession to pause and review the whole situation, but one would doubt whether the explanations offered will prove to be correct. For example: it is claimed that painful muscle spasm results in a mental "alienation", which is "the most damaging symptom as it leads to permanent paralysis of the part and deformity."

It is to be hoped that publicity given this book does not lead to a wave of over enthusiasm in those who are not in a position to give its views a proper trial, but it should certainly be seriously considered and put to the test by those with proper facilities to do so.

*Wounds and Fractures.* H. W. Orr. 227 pp., illust. \$5.00. C. C. Thomas, Springfield, 1941.

The publication of this "Clinical Guide to Civil and Military Practice", concerning wounds and fractures is well timed since it appears when the term "Orr treatment" is frequently used and often too, with little relation to the actual principles emphasized by Dr. Orr himself.

This treatise propounds a routine to be followed in applying the principle of "rest" to wounds and frac-

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tures. The interpretation of this principle being that of Hilton, John Hunter and H. O. Thomas. It does not discuss the various methods available in applying rest to wounds and fractures, nor the place of movement in the re-education of the part, nor the more difficult decision as to the time factors involved with the transition from rest to movement.

The principles laid down in the treatment of wounds are: (1) Adequate drainage. Saucerization if necessary. (2) Vaseline pack. No antiseptics. (3) Rest from repeated dressings. Should the wound be associated with a fracture, the principles underlying fracture treatment are added: (a) Adequate reduction. (b) Prolonged, uninterrupted and enforced rest by immobilization.

Orr prefers the use of skeletal traction obtained by pins below and above the fracture line and incorporated in plaster of paris as his ideal of fixation. The position of Lane's plating in its modern form with vitallium is not discussed, nor the use of mobile traction, except to state his preference for fixed traction. The principles of rest and fixation as outlined above are also applied to cases of osteomyelitis and infective arthritis.

Cases are quoted illustrating the points desired. Fractures and wounds of the limbs and trunk are chiefly considered. The application to war surgery and reference to Trueta's success in employing these methods in the Spanish War are included.

This is a valuable monograph, and should be read by all surgeons of the present day.

When placed in its proper position in surgical history concerning the treatment of wounds it is seen to be a system of applying rest to wounds and fractures—rest, such as Hilton, Hunter and the Liverpool School have also emphasized in their respective ways. With this principle are associated adequate reduction of fractures and adequate drainage of the respective areas.

**Surgery of Modern Warfare.** Edited by H. Bailey. Part 5, sections 9-13 incl., 641-876 pp. \$5.25. Macmillan, Toronto, 1941.

The fifth and final part of this excellent book has just been published. The main part of this issue takes up the treatment of wounds of the central nervous system. It is written primarily for the general surgeon, who may be called upon to treat this type of injury. In many instances it is impossible for these patients to reach a neuro-surgical unit. Injuries of the scalp, skull and brain are dealt with in some detail. The clinical picture of complete and incomplete lesions of the spinal cord is visualized. The operation of laminectomy is described very clearly. Disordered bladder function, which is a common complication of spinal cord injury is clearly described together with the appropriate treatment. An appendix has been added by the author himself in order to give a résumé of the surgical literature of the war to date. The new syndrome known as "Blast" is defined but no mention is made of the "Crush" syndrome.

We should have liked to have seen more importance given to Moon's work in connection with Shock, in which he has proved the appearance of hæmo-concentration long before there is any material fall in the blood-pressure.

We again wish to compliment the author and the publishers in producing a work which is a credit to themselves and of national importance.

**Diet in Sinus Infections and Colds.** E. V. Ullmann. 2nd ed., 185 pp. \$2.00. Macmillan, Toronto, 1941.

This book contains much material in a condensed form. It is short and well written and may be read with profit and pleasure by either the professional or the lay reader. In a way it is a reversion to the old humoral theory of disease, and the theme may be stated to be an emphasis on the importance of resistance to infection rather than on the bacterial impact of diseases of the upper respiratory tract.

According to Doctor Ullman, building up of resistance begins at the cradle and is more or less a continuous

process until death. He advocates the breast feeding of infants as being the natural and most suitable diet for the new-born child. This is the keynote of the discourse from start to finish. He abjures the use of canned or otherwise processed food and proceeds to show how these affect the vital resistance of the individual against colds and sinus infections.

His chapter on vitamins is most impressive. The lack of vitamin A is, in his opinion, a very common condition. As the author remarks, gross signs and symptoms may be absent but certain observations lead him to conclude that the condition exists and he proceeds to eradicate this by the administration of the natural vitamin A as found in fish livers to the extent of 100,000 units in adults and 25,000 to 30,000 in children to be kept up for a period of six months to one year.

According to Doctor Ullman, the use of salt is more a habit than a necessity and its excessive use is positively detrimental to the human economy, inasmuch as it causes waterlogging of the tissues and prevents the normal absorption of calcium.

His tables of acid- and alkali-forming foods are most instructive and should be borne in mind by those who are interested in acquiring a proper diet.

**Nutritional Deficiencies, Diagnosis and Treatment.** J. B. Youmans and E. H. Patton. 385 pp., illust. \$6.00. Lippincott, Montreal, 1941.

Among the many recent books on nutrition and the vitamins this stands out because it is written from a consistently clinical point of view. It is not, in fact, a book about nutrition and vitamins at all; it obeys its title, and treats the nutritional deficiencies as diseases, discussing their symptoms, diagnosis, and pathology, and the appropriate methods of treatment. The vitamins themselves come in merely as specific therapeutic agents, and in the discussions of etiology; and the whole book is based, as far as possible, on clinical rather than experimental studies. Little attention is paid to sub-clinical deficiency states and their possible rôle in lessening resistance; the author's attitude is one of sane and well-informed conservatism, and will certainly appeal to those who have become suspicious of the exaggerated claims often made on behalf of the vitamins. Moreover, the book covers a wide field: for it includes chapters, not only on deficiency of vitamins A, B, C, D, E and K and riboflavin and nicotinic acid, but also on deficiency of protein, calcium, iron, and iodine (the last, unfortunately, the least satisfactory part of the work).

Although he has transcribed his chemical formulae with care, the author is ill at ease and often inaccurate in his chemical terminology. He garbles the structural chemical names for riboflavin and ascorbic acid; he should not have said that "free iodine is found in the thyroid gland"; and "activated 7-dehydro-cholesterol is equally as effective as calciferol, unit for unit, against rickets in rats" is mere tautology, the point being that in the rat these two forms of vitamin D are equally effective, microgram for microgram. However, when Dr. Youmans stays on clinical ground, as he does for four-fifths of the book, he speaks with assurance and authority. He has avoided crowding his pages with bibliographical references, and contents himself with three or four, usually to review articles, at the end of each chapter; it may be objected that some of those that figure in his select list are not accessible in the average medical library. One may also question the wisdom of including in a lengthy appendix detailed directions for carrying out chemical determinations such as that of thiamin in urine or phosphatase in serum. These methods are not foolproof, and the biochemist who attempts them will surely wish to study the original detailed article rather than trust to this briefer transcription; a critical survey of the merits and accuracies of the many alternative methods would have been more helpful than step-by-step directions for the selected few. These criticisms should not, however, obscure the fact that the book competently fulfils the promise of its title.

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Diphtheria Toxoid	Staphylococcus Toxoid
Old Tuberculin	Tetanus Antitoxin
Perfringens Antitoxin	Tetanus Toxoid
Pertussis Vaccine	Typhoid Vaccines
Vaccine Virus (Smallpox Vaccine)	

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Adrenal Cortical Extract
Epinephrine Hydrochloride Solution (1:1000)
Epinephrine Hydrochloride Inhalant (1:100)
Epinephrine in Oil (1:500)
Heparin
Solution of Heparin
Insulin
Protamine Zinc Insulin
Liver Extract ( <i>Oral</i> )
Liver Extract ( <i>Intramuscular</i> )
Pituitary Extract (posterior lobe)

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Prices and information relating to these preparations  
will be supplied gladly upon request

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**Sulfanilamide and Related Compounds in General Practice.** W. W. Spink. 256 pp. \$3.00. Year Book Publishers, Chicago, 1941.

This is one of a series of "General Practice Manuals", and falls well within the limits to be expected from the last two words of its title. It will meet the needs of practitioners who read books rather than journals; for those who do use journals an extensive and well-classified bibliography of the clinical literature in English is included. The book concerns neoprontosil, sulfanilamide, sulfapyridine, sulfathiazole, sulfaguanidine and sulfadiazine. Their applications, details of use and toxic manifestations are treated. It is obvious that the author is thoroughly interested in his subject.

**Political Life of the American Medical Association.** O. Garneau. 182 pp. \$2.50. Harvard University Press, Cambridge, 1941.

The political study of a medical organization may not appeal immediately to the average medical man, but if the inertia regarding the political aspects of medicine is overcome, as it should be, the subject will be found to contain great interest. The American Medical Association has recently been the subject of such a study.

It is not our intention to appraise its accuracy or completeness for we gather that it does not satisfy the object of the discussion. But much of what it contains is applicable to our own or any other Association. Are medical men sufficiently given to thinking politically? (Truly that is being asked more and more persistently in these days). What ground is there for criticism of the administration of Association affairs? Is it true that a small group "runs" the Association? How genuine is the desire of the Association to subserve the highest ideals of medicine? What are the difficulties that develop in administration?

These are some of the points brought out by Mr. Garneau. They are worthy of consideration, and on that account we would recommend this book to medical men generally.

**Surgery of the Heart.** E. S. J. King. 728 pp., illust. \$15.00. Macmillan, Toronto, 1941.

While the title of this book is "Surgery of the Heart" it is much more comprehensive than such a title would indicate. The author begins with an exhaustive chapter on the embryology, the anatomy and the physiology of the heart. From such a sound introduction he has proceeded to a discussion of the general pathology of the heart and then to the methods of investigation at our disposal. Individual chapters are devoted to discussion of the surgical approach to heart diseases, diseases of the myocardium, diseases of the coronary vessels, diseases of the endocardium, diseases of the pericardium, etc. At the expense of some repetitions, each chapter has been made a reasonably complete exposition of the subject under discussion. This adds to its value as a reference work and this value is further enhanced by a lengthy bibliography at the end of each chapter.

This book should find a place in all medical libraries. It will of course be of particular value to surgeons specially interested in the surgery of the chest.

**Diseases of the Nails.** V. Pardo-Castello. 2nd ed., 193 pp. \$3.50. C. C. Thomas, Springfield, 1941.

This second edition of the excellent monograph by Dr. Pardo-Castello, Assistant Professor of Dermatology and Syphilology, University of Habana, which was originally reviewed in these columns in 1936, does not differ essentially from the first edition. Its appearance at this time is probably due to the wide popularity which the book achieved and no doubt has exhausted the first edition. The subject is one which physicians everywhere are poorly informed upon and which not even experienced dermatologists are as familiar with as desirable. Only one other treatise on the subject has

appeared and this, which is in German, appeared some years ago. Dr. Pardo-Castello has dealt with the subject very thoroughly and has copiously employed illustrative material. The second edition contains a few additional illustrations and a large number of new references.

The reviewer has found the book an indispensable addition to his library and it is warmly recommended to all those whose interests include study of abnormalities of the nails and contiguous tissues.

**Essentials of Electrocardiography for the Student and Practitioner of Medicine.** R. Ashman and E. Hull. 2nd ed., 373 pp., illust. \$5.00. Macmillan, Toronto, 1941.

The authors have, as the title suggests, presented the essentials of the theory and mechanism of electrocardiography. However the title is too modest to describe the concise and pointed remarks given in the chapters on interpretation. Clear-cut illustrations are presented of all types of useful electrocardiograms. The first half of the book deals with the basis and theory coupled with a good deal of material on the normal electrocardiogram. The chapter on the various diseases which may affect the heart is thoroughly up to date and recent experimental work is mentioned frequently. An excellent list of references at the back of the book is linked with the various chapters and offers a wide background to those who wish to look up in greater detail the points that are summarized in the book. One mild criticism is that it includes many minor changes of the electrocardiogram that are of little importance and cannot be explained on any pathological basis. Such detail tends to obscure the important defects associated with a disease and is only of value in a full account of the theory and mechanism of the electrocardiogram and therefore cannot be regarded as strictly a part of the essentials of electrocardiography. This however does not detract from the value of the book and students and physicians will find it one of the most clear and useful accounts of the electrocardiogram.

## BOOKS RECEIVED

**Cerebrospinal Fever.** D. Brinton. 163 pp. \$2.50. Macmillan, Toronto, 1941.

**The University and Public Health Statesmanship.** A. P. Hitchens et al. 33 pp. \$0.50. University of Pennsylvania Press, Phila., 1941.

**Biological Symposia.** Vol. 3, Muscle, edited by W. O. Fenn. 369 pp., illust. \$2.50. J. Cattell Press, Lancaster, Pa., 1941.

**Manual of Otology, Rhinology and Laryngology.** H. C. Ballenger. 302 pp., illust. \$4.50. Macmillan, Toronto, 1940.

**The Periodicity and Cause of Cancer, Leukæmia and Allied Tumours.** J. H. D. Webster. 178 pp. \$3.75. Macmillan, Toronto, 1940.

**Psychiatric Social Work.** L. M. French. 344 pp. \$2.25. Commonwealth Fund, New York, 1940.

**International Clinics.** Edited by G. M. Piersol. Vol. 3, N.S. 4, 300 pp., illust. \$3.00 a vol. Lippincott, Montreal, 1941.

**The Principal Nervous Pathways.** A. T. Rasmussen. 2nd ed., 73 pp., illust. \$2.50. Macmillan, Toronto, 1941.

**The Care of the Aged.** M. W. Thewlis. 3rd ed., 579 pp., illust. \$7.00. McAinch, Toronto, 1941.

**Necropsy.** B. Halpert. 75 pp. \$1.75. McAinch, Toronto, 1941.

**Marked for Tragedy.** E. Webb. 38 pp. \$0.25. Ryerson Press, Toronto, 1941.

# The Canadian Medical Protective Association

PRESIDENT - JOHN F. ARGUE, M.D.

A mutual medical defence union founded in 1901. Incorporated by act of Dominion Parliament, February, 1913, and affiliated with the Canadian Medical Association, 1924.

**OBJECTS:** To assist in the defence of its members in cases of alleged malpractice, and to encourage honourable practice in the daily work of the medical profession.

Subject to our by-laws, assistance is given by the payment of the taxable costs of actions together with reasonable counsel and witness fees in cases undertaken by our Association, as well as damages if awarded. All members in good standing of the Canadian and various Provincial Medical Associations may be enrolled upon signing the application form and paying the annual fee. All other regularly qualified practitioners must have their application countersigned by two members of our Association.

Address All Correspondence to the Secretary-Treasurer,  
Suite 401, 180 Metcalfe St., Ottawa, Canada

## APPLICATION FOR MEMBERSHIP

I, ..... aged ..... Print name in full. a qualified practitioner of the Regular School of Medicine hereby apply to be enrolled as a member of the Canadian Medical Protective Association.

I am a graduate of ..... University in the year ..... and a duly licensed practitioner of the Province of ..... I am also a member in good standing of ..... Medical Association. Canadian or Provincial

Signature.....

Address.....

Recommended by two members of the Association, unless applicant is a member in good standing of the Canadian or any Provincial Medical Association

Dated at ..... 19 .....

The annual fee is five dollars per calendar year, half rates after July first. (Payable at par, Ottawa.)

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**DOCTOR.**—Wanted as full time assistant for Plant Hospital. Single. Bilingual. Two to three years' internship in Teaching Hospital. Interested primarily in medicine but capable of doing minor surgery. Some training in anaesthetic administration. Apply Box 378, Canadian Medical Association Journal, 3649 University Street, Montreal.

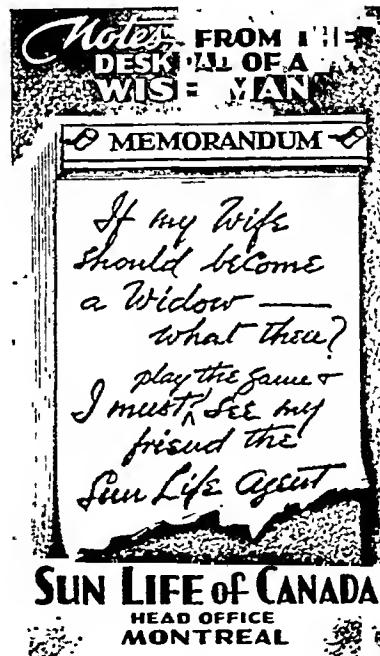
**WANTED.**—Applications will be accepted from qualified medical graduates, male or female, for internship in the Department of Anaesthesia of the Royal Victoria Hospital, Montreal. Term of service one year, from July 1st, 1942 to June 30th, 1943. Room, board, uniforms and salary provided. A thorough training in all the various forms of anaesthesia is afforded. There is an opportunity for one intern to commence at the present time. Address applications to the Superintendent, Royal Victoria Hospital, Montreal.

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**WANTED.**—Resident graduate intern for July 1, 1942, with at least one year's experience, for fifty bed obstetrical hospital. Active prenatal clinic and public service. Full maintenance and salary provided. Position offers excellent practical experience in obstetrics. Apply to Superintendent, Catherine Booth Hospital, Montreal.

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**FOR SALE.**—West Toronto residence of the late Dr. A. T. MacNamara for sale. Outstanding corner, two bathrooms, hot water heating, double garage. Apply Mrs. A. T. MacNamara, 318 Keele Street. Junction 2151.



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**ENTERO-VIOFORME** possesses a powerful parasiticidal, antifermentative and antiputrefactive action. It is harmless to the organism, well tolerated even on prolonged administration. Its non-toxicity, its convenient methods of use,—oral, rectal or vaginal,—and the fact that its administration does not interfere with the patient's usual activities, make it a product of choice.

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Thus does Dr. R. R. Williams recall\* his early experiences with chemical

fractionations of rice polish in cases of infantile beriberi. Despite these dramatic results, it is now known that crude rice-polish extracts contain only 1 part of thiamin chloride in 50,000.

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\*Williams, R.R.: Indust. & Eng. Chem. 29:980-984, Sept. 1937.

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Libby's exclusive Homogenization process breaks up tough food cell walls, exposing nutrient inside the cell for easier digestion. Libby's Homogenized Vegetables and Fruits are not only easily digestible, but they yield more nutriment than an equal amount of strained food.

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These three photographs show stools of normal infants (diluted 7 times with water and stained with Lugol's solution) 100 times magnified.



Stool of normal infant fed home-strained vegetables. Some of the food is undigested. Many coarse fibres are also seen.



Stool of normal infant fed commercial-strained vegetables. Here, also, some food has not been completely digested. Note coarse fibres that may cause intestinal irritation.



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## 10 BALANCED BABY FOOD COMBINATIONS:

These combinations of Homogenized Vegetables, cereal, soup and fruits make it easy for the Doctor to prescribe a variety of solid foods for infants

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- 10 Tomatoes, carrots and peas. These give a new vegetable combination of extremely good dietary properties and flavor.

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Note These **4**  
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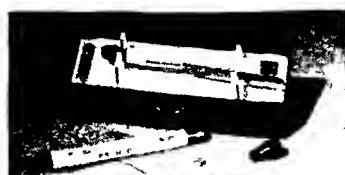
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# The importance of **UNIMPEDED** **CILIARY ACTIVITY** of the nasal epithelium

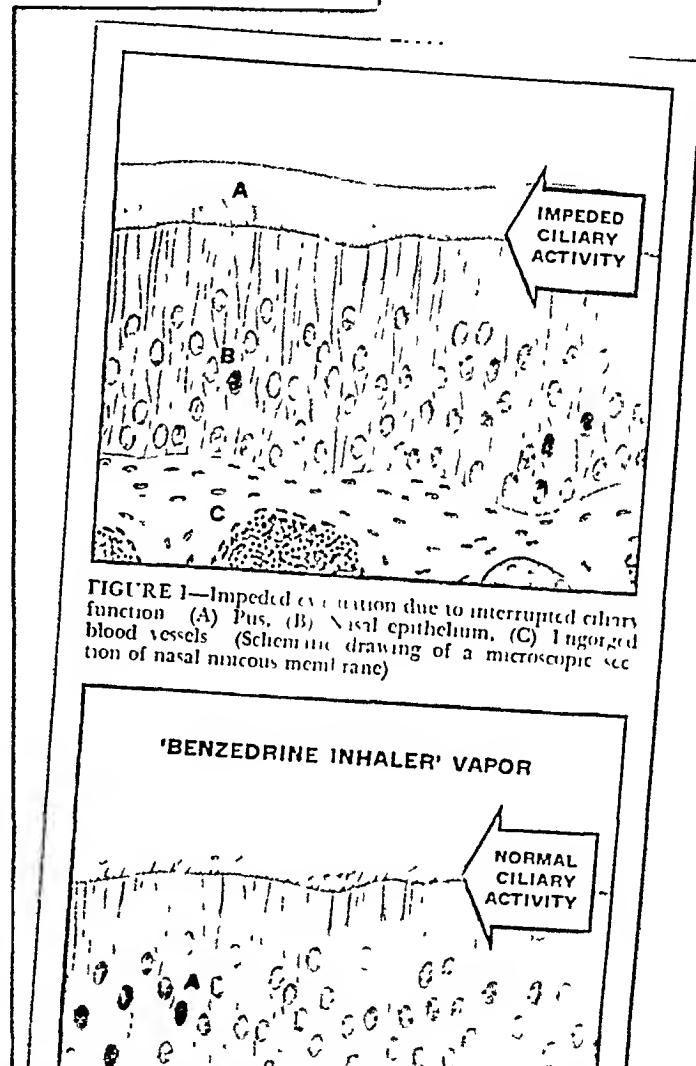
In recent years, leading authorities have repeatedly emphasized that no medication which interferes with ciliary movement should be employed in the nose.

Drainage, a *sine qua non* of upper respiratory health, depends not only upon patency of the nasal passages but also upon rapidity and amplitude of the ciliary beat. Interference with normal ciliary movement may actually impede evacuation.

In a recent report,\* Proetz records the action of several of the more commonly-used drugs on the nasal ciliated epithelium. He concludes that even after experiments lasting twenty minutes on living rabbits, on extirpated rabbit mucosa and on extirpated human mucosa, 'Benzedrine Inhaler' causes "no appreciable change in the amplitude or rapidity of the ciliary beat."

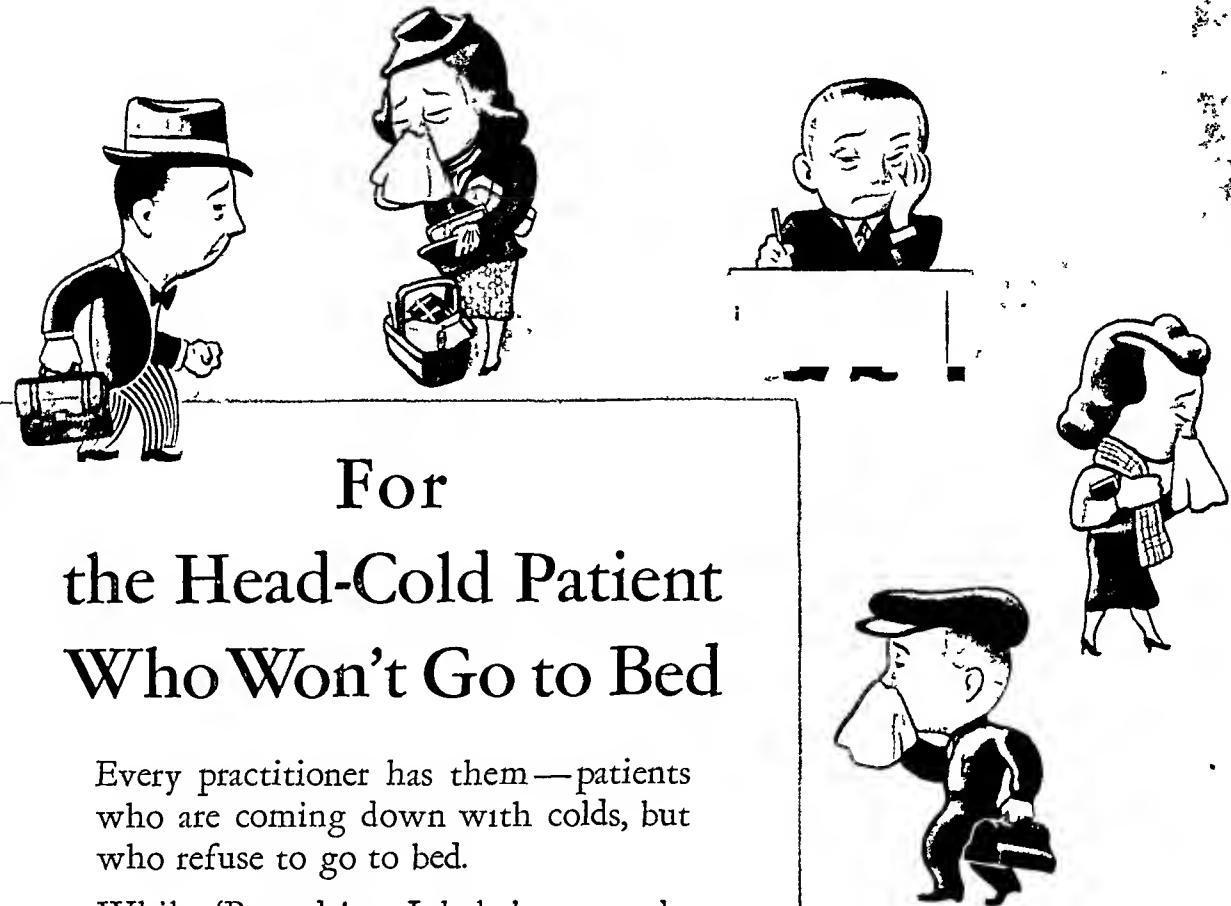
\* Proetz, A. W.—Arch. Otolaryngol., 30: 509, 1939.

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## For the Head-Cold Patient Who Won't Go to Bed

Every practitioner has them—patients who are coming down with colds, but who refuse to go to bed.

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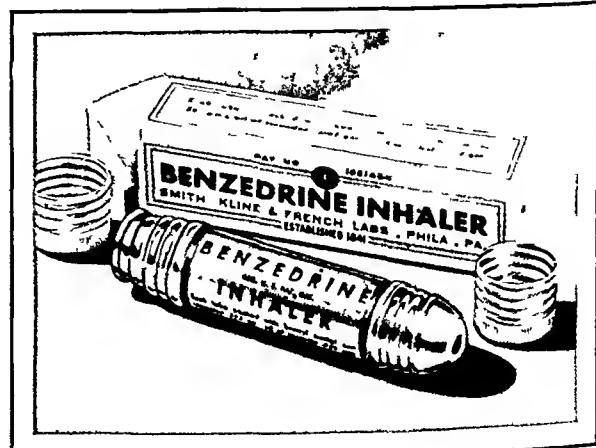
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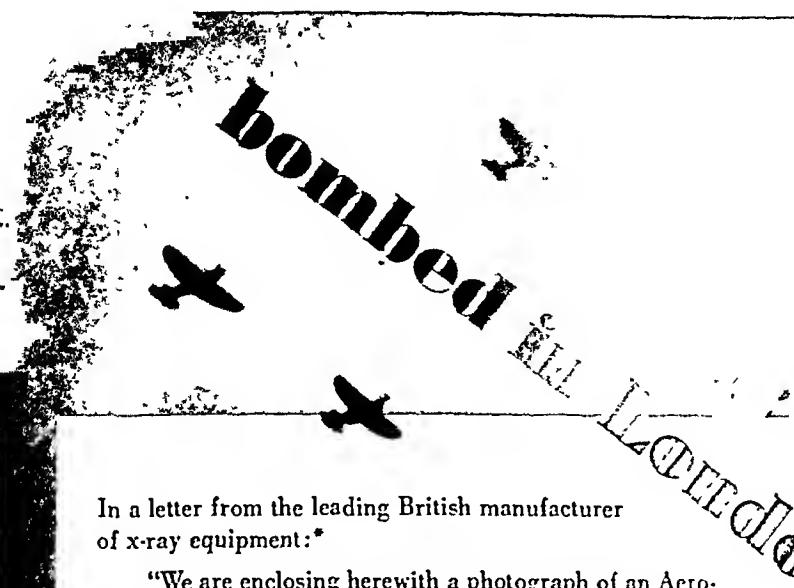
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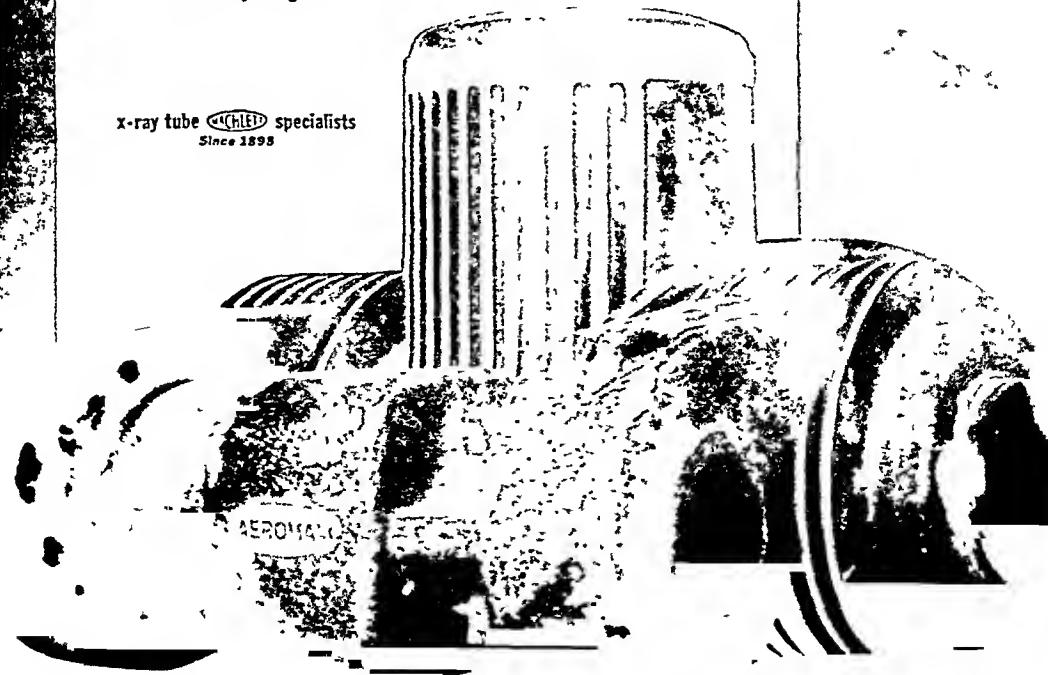


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"We are enclosing herewith a photograph of an Aeromax tube which was supplied by us with a mobile x-ray unit. The unit has since been completely destroyed by enemy action, but we have been able to rescue the tube. The case of the tube is pitted with shrapnel, as shown on the photograph, but the insert is intact and the tube still operates satisfactorily."

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*American Can Company, Hamilton, Ontario;  
American Can Company Ltd., Vancouver, B.C.*

(1) 1932. J. Am. Med. Assoc. 98, 1429.

1938. Nutrition Abstracts and Reviews 8, 281.

1938. J. Am. Med. Assoc. 110, 650.

1940. J. Am. Diet. Assoc. 16, 891.

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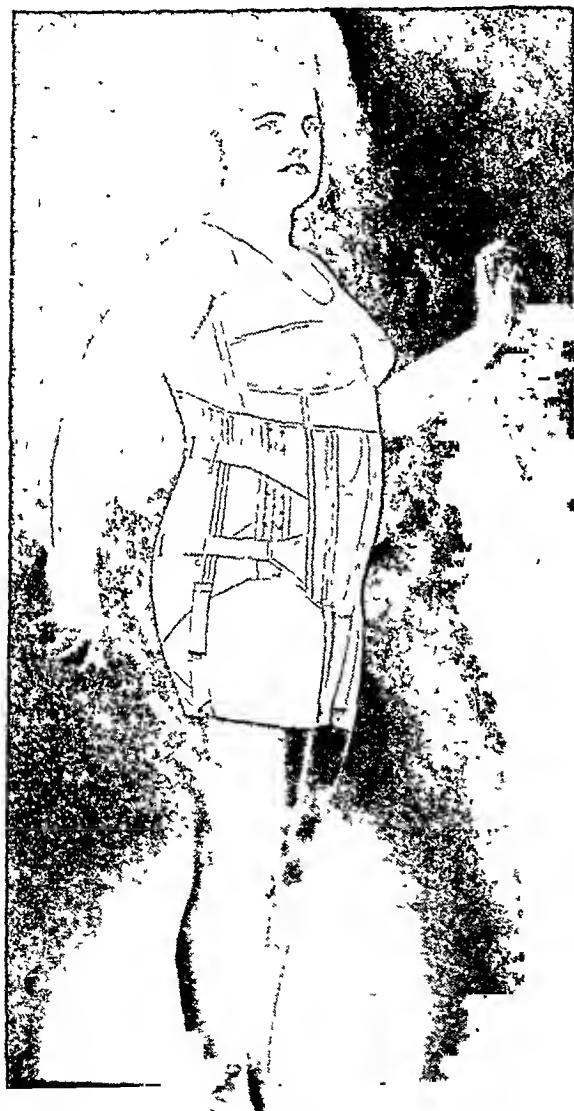
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- The dangers and discomfort attendant upon pregnancy and labor occurring in women with pendulous abdomen are well known.

That the wearing of an effective prenatal support gives comfort to the patient during pregnancy and is an aid in preventing the complications of labor is also well known.

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The center front of these supports is reinforced with material which is kept soft yet firm with stripping. Elastic insets and elastic in the forked portions of the upper adjustment furnish the necessary firmness at the top and yet give comfort and allow freedom in breathing.

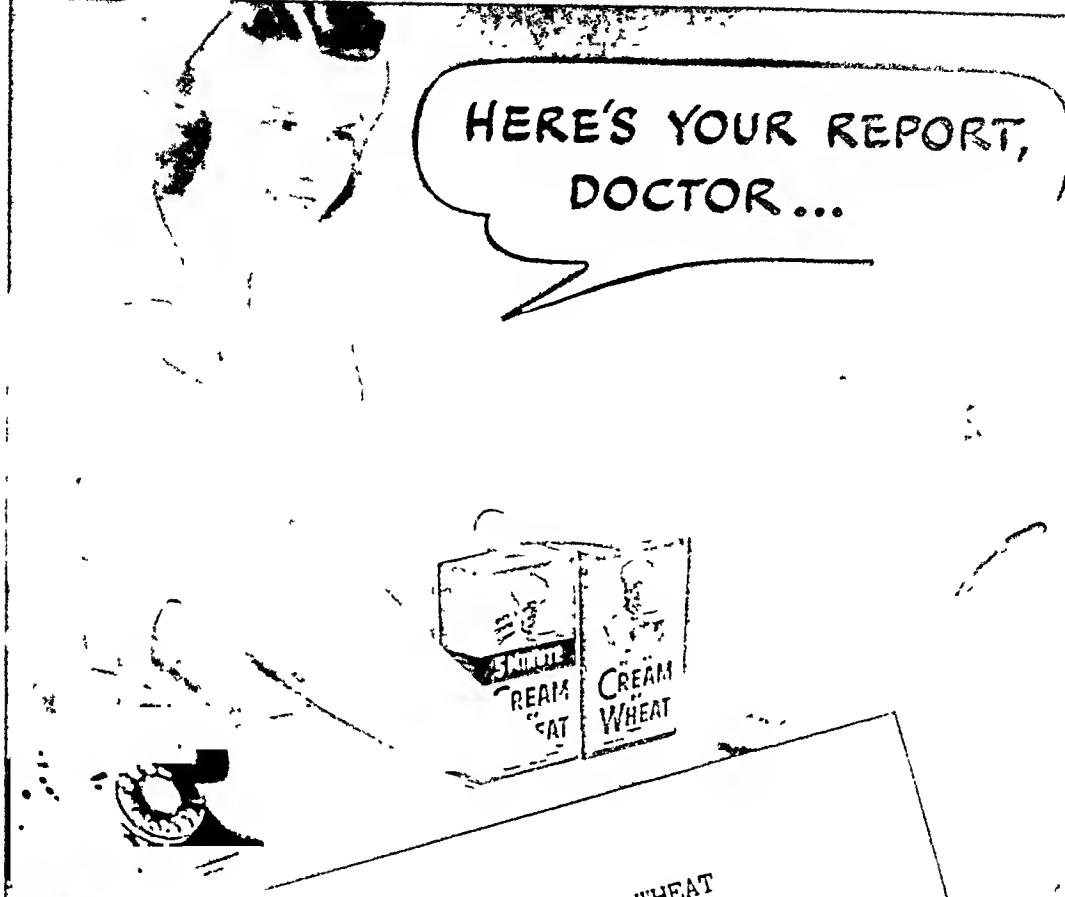
The support provides for protection of the sacro-iliac joints and comes well down under the gluteus muscle.

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5-Minute "CREAM OF WHEAT"

Each ounce contains in average  
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Phosphorus.....168 mg.

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Actually contains more of these min-  
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Cooks to full digestibility—even  
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Both very economical. You get 40  
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For 40 years Aspirin has been one of the most widely used therapeutic agents in the physician's armamentarium — not only in colds, influenza or la grippe, but in neuralgia and rheumatic affections.

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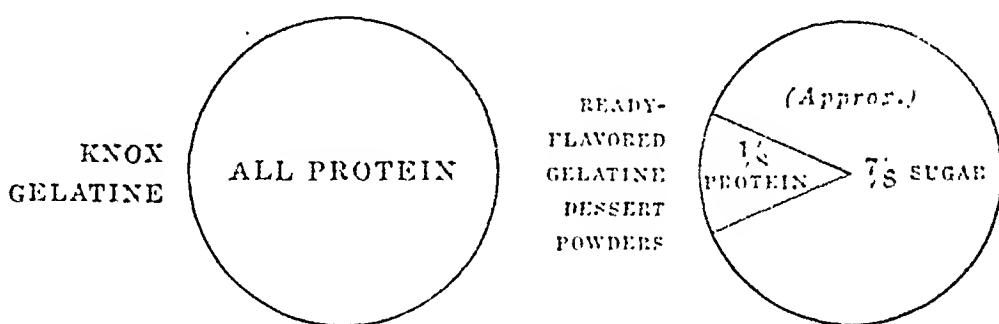
We shall be glad to forward you professional samples of Aspirin on request.



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the difference between gelatine dessert powders  
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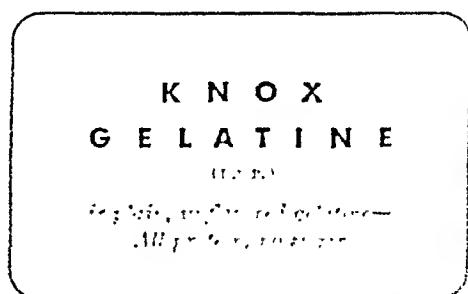


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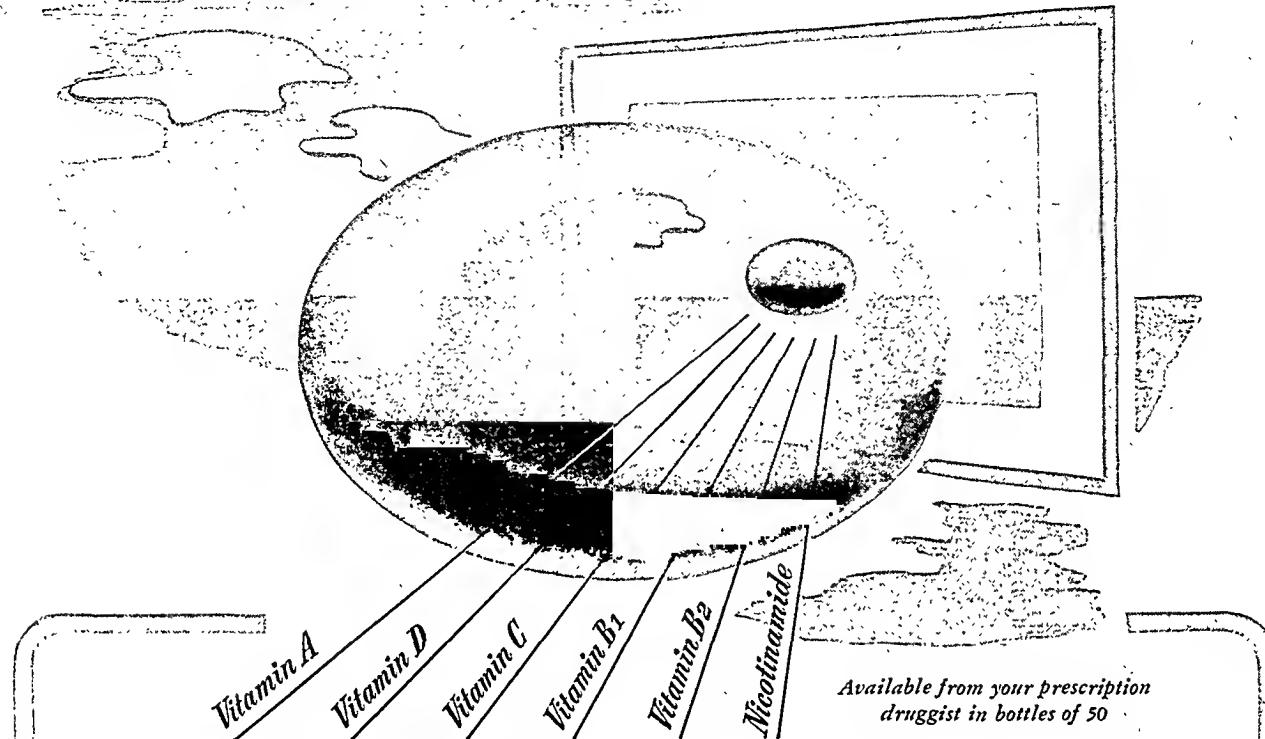
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Dietetic Dietetic Gelatine



# NOW Unicap\* Vitamins



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## ONE CAPSULE MEDICATION

*Convenient for the Physician  
Economical for the Patient*

With Unicap Vitamins, you can prescribe, *in one capsule*, the fat-soluble vitamins—the vitamins of the B complex group, and vitamin C.

Only one Unicap a day is necessary to fortify the average diet, thus making for convenience to the physician and economy to the patient. Taken regularly in the morning, a Unicap Vitamin capsule soon becomes a part of the patient's daily routine.

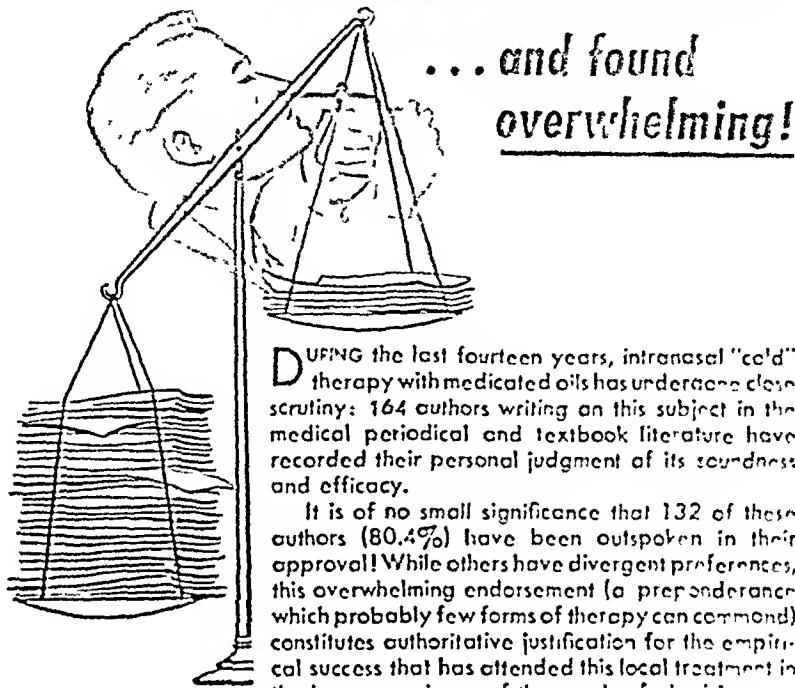
Vitamin A, . . . . . 10,000 U.S.P. units  
Vitamin D, . . . . . 1,000 U.S.P. units  
Vitamin C, . . . . . 500 International units  
(25 mg. ascorbic acid)

Vitamin B<sub>1</sub>, . . . . . 500 International units  
Vitamin B<sub>2</sub>, . . . . . 1,000 gammas  
Nicotinamide, . . . . . 20 milligrams

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**Upjohn** • FINE PHARMACEUTICALS SINCE 1886  
TORONTO, CANADA

## WEIGHED IN THE BALANCE



... and found  
overwhelming!

DURING the last fourteen years, intranasal "cold" therapy with medicated oils has undergone close scrutiny: 164 authors writing on this subject in the medical periodical and textbook literature have recorded their personal judgment of its soundness and efficacy.

It is of no small significance that 132 of these authors (80.4%) have been outspoken in their approval! While others have divergent preferences, this overwhelming endorsement (a preponderance which probably few forms of therapy command) constitutes authoritative justification for the empirical success that has attended this local treatment in the long experience of thousands of physicians.

'Pineoleum's' classic formula incorporates those helpful medicinal ingredients recommended by leading authorities for intranasal medication. It fulfills the requirements for astringency and local sedation, for mucosal stimulation, and for the inhibition of bacterial invasion. Its soothing film aids in correcting dryness and promoting ciliary activity... in reducing congestion and "fullness of the head"... and (by mild antiseptic) in forestalling complications, assisting the recuperative process, and lessening danger of contagion. That's why physicians (after nearly 40 years of clinical employment) increasingly prescribe 'Pineoleum' for local "cold" relief.

### AVAILABLE

'Pineoleum' Plain in specially constructed Nebulizer Bottles; in 30 cc. dropper bottles; 100 cc. and 1 pint bottles. 'Pineoleum' with Ephedrine, in 30 cc. dropper bottles and 1 pint bottles. And 'Pineoleum' Ephedrine Salve, in nasal applicator tubes.

Write for trial supply,  
LYNN AGENCIES,  
Limited,  
295 St. Paul St., W.  
Montreal - Canada

### FORMULA

"Pineoleum" Incorporated  
contains: 150cc. Mineral  
Oil, 10cc. Camphor Oil,  
5cc. Menthol Oil, 1.10cc.  
and 1.10cc. 10%  
Inerted Ephedrine  
Salve, 10cc. Lanolin  
and 10cc. Paraffin.

# PINEOLEUM

PLAIN OR WITH EPHEDRINE

# FAITHFUL PERFORMANCE



YOU can schedule any day for your view of this wonder act of Nature, for never has *Old Faithful* failed to perform daily as anticipated.

Albeit he must be content to fall short of absolute infallibility, to emulate Nature in her many similar demonstrations of dependability is constantly the aim of man's own creations.

For example, the designing and building of apparatus for x-ray therapy—a field that has long inspired G-E physicists and engineers to ever higher achievements. Their's seems a justifiable pride when citing the performance records of hundreds of G-E Maximar Therapy Units in use the world over—records which indicate a reliable day-to-day service over long periods of time, with gratifyingly low maintenance costs.

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*Antiphlogistine*  
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HILLTOP HOMES

# British Hospitals prescribe **SOUTH AFRICAN BRANDY**

The extensive use of South African Brandy in the Hospitals of Great Britain is a sterling tribute to its purity and medicinal value. Owing to its high ester content this brandy, from the sunny Cape, is highly recommended by the British Medical Faculty.

Over 250 years of wine-making tradition . . . winner of the Gold Medal in competition with all similar Empire Products at the Royal Agricultural Hall, London, England, 1937 . . . the age and purity of South African Brandy is guaranteed by the South African Government.

*Other Superb*  
**South African Vintages**  
*Sold in Canada:*

- PAARL VERMOUTHIS  
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- PAARL DRY WHITE
- PAARL WITZENBERG
- PAARL SAUTERNES
- PAARL DRY RED  
(Burgundy Type)
- PAARL SPARKLING  
BURGUNDY
- PAARL SPARKLING  
WINTERHOEK  
(Champagne Type)
- PAARL MUSCATEL

OLD VINTAGE LIQUEUR BRANDY

## THE SPHERE

## OF *Usefulness* FOR



### DESCRIPTION

Iodex is an ointment containing iodine in organic combination, the iodine loosely combined with a fatty organic carrier suspended in a petrolatum base. Chemical name: Mono-iodo-oleic acid.

### ACTION

As long as Iodex remains in contact with body tissues in minor cuts, wounds, abrasions, iodine gradually separates from the molecule of the carrier substance and inhibits the growth and action of bacteria and promotes healing.

On unbroken surfaces of the living body Iodex is absorbed into the skin, oxidation slowly liberating the iodine from the carrier.

Sample and Literature Upon Request

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(Sweet or Dry)
- PAARL DRY WHITE
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Sample and Literature Upon Request

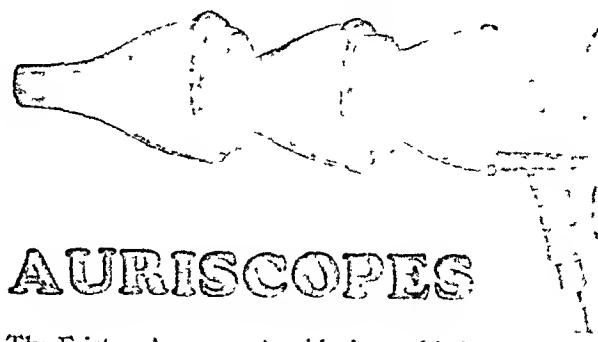
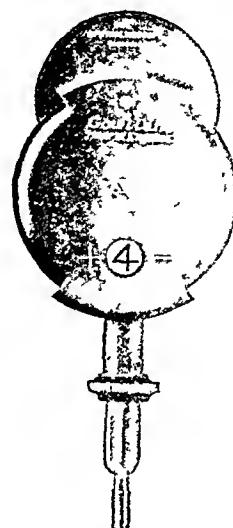
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The Gowland improved May Ophthalmoscope has illuminated and magnified numbers. The figures are brilliantly illuminated by the Ophthalmoscope lamp and magnified to nearly twice the size of those in the older type of instrument. They are positioned well away from the sight-hole and cannot interfere with the observation.

The patch of light projected is bright and absolutely even, while the reflecting prism is adjusted so that there are no shadows and that the corneal reflex is minimised.

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The Friston Auriscope has black moulded bakelite specula which are practically unbreakable, never feel cold for the patient, and being black inside eliminate the glare into the user's eye. The shape allows ample space for manipulation.



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## HARTZ

*A Potent but Safe  
Antispasmodic and Sedative*

Pulvets

## BUTYLONE

Hartz Brand of  
**Sodium Butyl-Ethyl-Methyl Barbiturate**

Butylone Hartz, affords a prompt yet relatively brief Hypnotic Action and is thus a most satisfactory Preanaesthetic Sedative. No unpleasant sequela follow its use.

Butylone Hartz, is one of the most rapidly acting of the Barbituric Compounds, and can therefore be given in relatively larger doses with less danger to the patients' life. Butylone Hartz, is an effective Analgesic in obstetrical practice and may be used in conjunction with Hyoscine or Morphine.

### DOSAGE:

As a Hypnotic, One pulvet.

As a Preanaesthetic Sedative, Two pulvets.

Available in one and one-half grain Pulvets and in three-quarter grain or one and one-half grain Caflets



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# In Colds, Bronchitis, Grippe or Laryngitis?

May we suggest the use of

## ANGIER'S EMULSION

*to secure the following results.*

1. Soothing of the irritated and inflamed membrane of the throat areas and facilitation of secretion and expectoration. Angier's thus moderates the intensity of the acute symptoms with almost immediate comfort to the patient. The cough becomes productive and easier.
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3. After the acute symptoms have subsided, ANGIER'S will improve the appetite and exert a tonic influence.

WHAT MORE CAN BE DESIRED?

*Angier's is safe for infants, aged and diabetic patients.*

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A HIGHLY efficient emmenagogue, Ergoapiol acts to normalize menstrual function by inducing pelvic hyperemia, and stimulating smooth, rhythmic uterine contractions. It also constitutes a desirable hemostatic agent to help control excessive bleeding.

Welcome Relief in Menstrual Disturbances with  
**ERGOAPIOL**

(Smith)

These properties enable the physician by symptomatic treatment to ameliorate the distress of amenorrhea, dysmenorrhea, menorrhagia and metrorrhagia of functional origin. Its unusual efficacy arises from its balanced content of all the alkaloids of ergot, together with apiol (M. H. S. Special), oil of savin and aloin.... May we send you a copy of the comprehensive booklet, "Menstrual Regulation"?

**INDICATIONS**  
Amenorrhea, Dysmenorrhea, Menorrhagia, Metrorrhagia, Menopause, in Obstetrics

**DOSAGE**  
One to two capsules three or four times daily.

**HOW SUPPLIED**  
In ethical packages of 20 capsules.

Ethical protective mark,  
M. H. S., visible only when capsule is cut in half at seam.

MARTIN H. SMITH CO.

150 LAFAYETTE STREET

NEW YORK, N. Y.



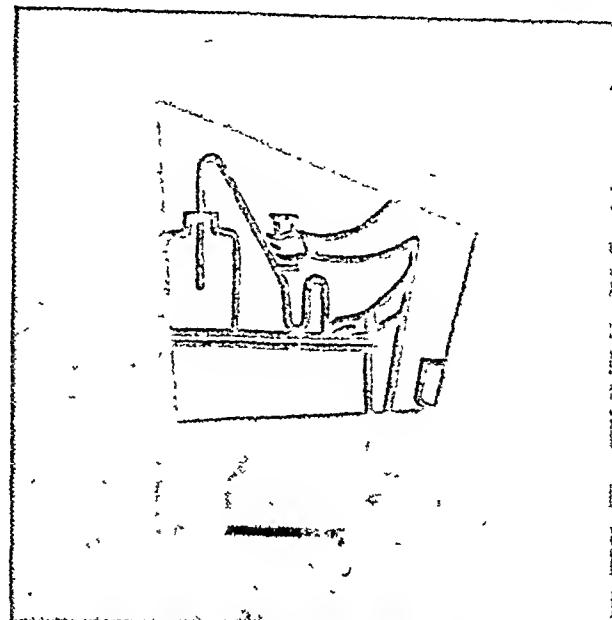


For more than fifty years many physicians have prescribed Sanmetto with satisfactory results in disorders of the urogenital tract.

**Alone or combined with other indicated medication this sooth-  
ing preparation pro-  
vides added comfort to your patients, less-  
ens possible drug irritation.**

Sanmetto is a preparation of Sandalwood, Saw Palmetto and Corn Silk. Alcohol 20.6%. One to two drams every four hours, four times a day, is considered the optimum dose.

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Let us apply our FRIENDLY plan of collection to your delinquent "accounts receivable".

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Hanger Artificial Limbs have won world-wide recognition and approval. Many of our country's largest industries furnish their employees with Hanger Limbs. Outstanding surgeons approve and recommend them to their patients.

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Established 1861

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INHALATION  
IS THE DIRECT METHOD  
OF TREATING BRONCHITIS,  
COLDS, WHOOPING COUGH.

Direct, repetitive action! Therein lies Vapo-Cresolene's notable efficacy. With the Vapo-Cresolene lamp in operation, the patient's breathing draws the decongestive, mildly antiseptic, sedative vapors into repeated contact with the inflamed respiratory mucosa. The natural result is the quick subduing of cough, clearing of the breathing passages, relief of irritation and re-established respiratory calm. As Vapo-Cresolene avoids the alimentary tract, there is no appetite depression. Hence, it is especially adaptable for use with any nutritive regimen. Prescribed also for symptomatic relief of Spasmodic Croup and Bronchial Asthma. Write for physician's literature, Dept. 3.



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THE VAPO-CRESOLENE CO.  
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(Trade Name)

(Wine of Vitamin B<sub>1</sub>, Nicotinic Acid and Riboflavin)

Each fluid ounce contains:

Thiamin Chloride (Vitamin B<sub>1</sub>) 8. mg. (2664 Int. Units).

Nicotinic Acid - - - - - 40. mg.

Riboflavin - - - - - 0.8 mg.

Sherry Wine, detannated - - - - q.s.

**INDICATIONS**—Beriberi and "latent beriberi"; anorexia, especially of dietary origin; intestinal atony; to secure optimal growth in children; vomiting of pregnancy; neuritis of pregnancy; alcoholic neuritis; neuritis of pellagra; conditions of augmented metabolism as febrile conditions, hyperthyroidism or vigorous muscular activity; acute pellagra in relapse.

**DIRECTIONS**—One teaspoonful containing 1. mg. (333 International Units) Thiamin Chloride, 5. mg. Nicotinic Acid, and 0.1 mg. (100 micrograms) Riboflavin, as directed by Physician.

Ethical Pharmaceutical Products

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effective treatment suggests the use of agents to correct mineral deficiency, increase cellular activity, and secure adequate elimination of toxic waste.

### LYXANTHINE ASTIER

orally given, supplies calcium, sulphur, iodine, and lysidin bitartrate—an effective solvent. Amelioration of symptoms and general functional improvement may be expected.

Since the best evidence is clinical evidence, write for literature and sample.

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If by any chance you've neglected your past-due accounts, Now's the time to turn over a New Leaf!

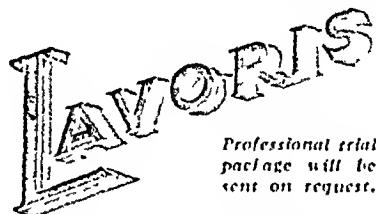
THE MEDICAL AUDIT ASSOCIATION  
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**MAIL US YOUR LIST TO-DAY!**

## SICK ROOM

LAVORIS is soothing and refreshing. Used as a daily mouthwash, gargle or atomizer solution it adds much to the patient's comfort.

The pleasant flavour enlists the co-operation of patients, both young and old. It aids in preventing absorption and ingestion of toxic matter by keeping the parts more sanitary, and promptly corrects disagreeable breath and taste.



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FAMOUS FOR PURITY  
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Beginning the tenth day of the Slipper diet, many doctors add rennet-custards made with "JUNKET" RENNET TABLETS to the list of permissible foods. The rennet enzyme makes them more readily digestible than plain milk, and they form softer, finer curds.

**FREE** . . . Ask on your letterhead for our new book "Dietary Uses of Rennet-Custards," and for samples of "Junket" Food Products.

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Not Sweetened or Flavoured

"JUNKET" RENNET POWDER

6 Flavors

Packed in institutional and household sizes

**"THE 'JUNKET' FOLKS"**

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HAMILTON BAILEY—Surgery of Modern Warfare ..... \$22.50

BOURNE—Nutrition and the War \$1.10

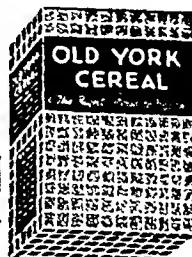
WATSON-JONES—Fractures ..... \$15.00

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Write to  
The Macmillans in Canada for them

ADDED  
**Wheat Germ**  
gives this laxative food  
extra vitamin potency



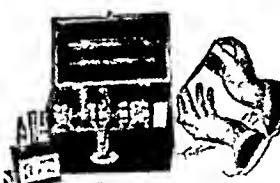
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Old York Cereal contains fine bran, flax, 100% whole wheat, and uncrushed Wheat Germ, scientifically blended into a delicious cereal which provides bulk, roughage and natural oil for lubricating the digestive tract.

**FREE OFFER to Medical Profession**  
A complimentary 2-lb. clinical package will be sent to you postpaid, on request.

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**OLD YORK**  
**CEREAL**  
*truly laxative*



**LaMotte**  
**Blood Sugar**  
**Outfit**

For rapid estimation of blood sugar in determining sugar tolerance for diabetic patient. Uses only few drops of finger blood. Permits tests at close intervals. Invaluable for infant cases. Accurate to 10 mg. of sugar per 100 c.c. of blood. Direct result without calculations. Only 20 minutes required for complete test. Complete with Instructions, price \$24.00, f.o.b. Baltimore, Maryland.

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**KAOMAGMA**  
**FOR**  
**DIARRHEA**

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*Rapid*  
IN ACTION

*Balanced*  
IN COMPOSITION

# VARBITAL

## SEDATIVE

Varbital is a scientifically tested formula to quickly promote a peaceful sleep or to safely relieve nervous irritability during waking hours. Administration of Varbital produces in the patient a sense of well-being and serenity not ordinarily found in conventional hypnotics and sedatives. Varbital possesses a secure calmative action. The balanced prescription assures freedom from depressant after effect. Neither cumulative nor habit-forming action has been reported from the use of Varbital during the past five years.

## THE FORMULA

Each 15 minim dose represents:

1/4 gr. PHENOBARBITAL SODIUM—Specifically sedative to central nervous system.  
 3/4 gr. COMBINED BROMIDES—allows reduction of irritability of psychomotor tract.  
 1/2 min. FLUID EXTRACT PASSION FLOWER—Anodyne and sedative.

2 min. TINCTURE VALERIAN—Sedative to central nervous system, also slightly increasing heart action.

1/2 min. TINCTURE HYOSCYAMUS—Sedative to parasympathetic, sympathetic and enteric nervous system.

1/2 min. CRATAEGUS OXYACANTHUS F.E.—The "Safety Factor" of Varbital. Cardiac tonic action tends to prevent "over-hang".

Base—AROMATIC DIGESTIVE ENZYMES (Full strength).

## INDICATIONS

Insomnia, restlessness, alcoholism, sexual excitement, spasmotic cough, gastro-intestinal neurosis, hyperemesis gravidarum, mal de mer, emotional instability associated with menopause, high tension and coronary thrombosis.

## ADMINISTRATION

AS A SEDATIVE: 5 to 15 minimis three or four times a day followed by one-half to one drachm upon retiring.

AS AN HYPNOTIC: One drachm repeated in 30 minutes if not sleeping.

In alcoholism much larger doses are tolerated and these may be repeated at the physician's discretion.

Clinical package available on request

**ANGLO CANADIAN DRUG COMPANY**  
Manufacturers of Fine Pharmaceuticals  
Laboratories - - - Oshawa, Canada

## ARE YOU SEEING MANY CASES OF INDUSTRIAL LOW-BACK PAIN?

Sacro-iliac or Lumbo-Sacral Sprain? Hernia?

A Spencer Support is a Most Effective Method of Relief and Prevention



In speeding up defense production many men and women are doing arduous work for which they have not been physically prepared. As a result, excess fatigue, sacro-iliac and lumbo-sacral sprain and hernia sometimes follow.

A Spencer Support, designed especially for the patient to meet the ever changing needs as well as health condition of the person who is to wear it, is a most effective means of providing relief and protection.

Each Spencer is individually designed to support the abdomen from below upward and backward—and to guide the body into improved posture thus enabling the wearer to increase his (or her) utility and endurance.

In a Spencer the weight of support is borne by the pelvic ridge—the spine at, or above—the bar region. (A support that places strain on it causes, rather than relieves, backache.)

A Spencer gives more for the money than an ordinary support because it is guaranteed to keep its exact shape on to the very last day it is worn. (A support that stretches or gets out of shape becomes worthless as a support.) Patients find Spencers completely satisfactory because they wear so long, are easily laundered, perfectly comfortable, flexible and safe.

For service at your office, the hospital or patient's home, look in telephone book under "Spencer Corsetiere" or write directly to us.

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# Magnolax absorbs intestinal toxins

A unique therapeutic effect distinguishes Magnolax—a stable emulsion of liquid paraffin and milk of magnesia—from ordinary laxatives and cathartics. This property makes it of supreme value in the treatment of intestinal stasis.

Magnolax absorbs and carries out of the system various harmful and putrefactive products, such as indol, phenols and other intestinal toxins.

And Magnolax does not contain phenolphthalein which may irritate the colon and cause damage to the liver in sensitive persons, especially children.

*Samples for clinical trial to physicians on request.*

**HENRY K. WAMPOLE & CO., LIMITED**

*Manufacturing Pharmacists*

PERTH, ONTARIO, CANADA

## ORALLY OR BY INJECTION

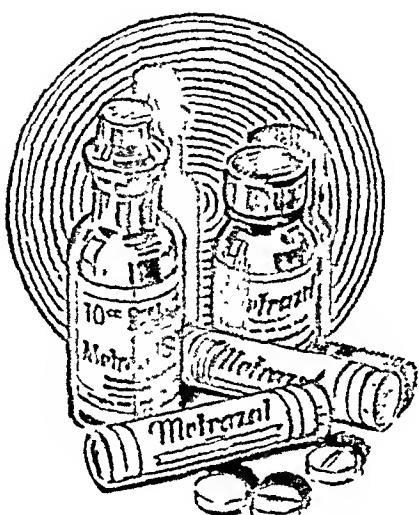
*Metrazol Tablets, Oral Solution and Powder for prescription compounding.*

COUNCIL ACCEPTED

For circulatory and respiratory support in the emergencies of congestive heart failure or pneumonia prescribe Metrazol, tablets or in solution, three or four times a day. In extreme cases oral administration may be supplemented by injections.

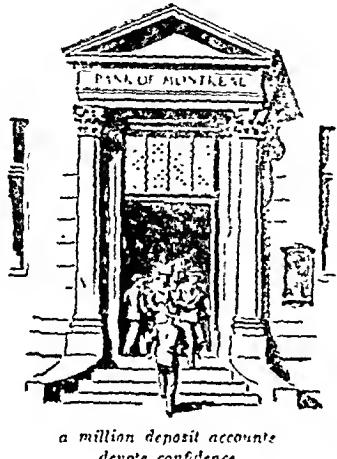
DOSE:  $1\frac{1}{2}$  to  $4\frac{1}{2}$  grains (1 to 3 tablets, or 1 to 3 cc. oral or parenteral solution).

Metrazol (Pentamethylentetrazol) T. M. Reg. U. S. and Canada.  
Manufactured by BILHUBER-KNOLL CORP., Orange, N. J.



**MERCK & CO. Ltd., Selling Agents, 560 De Courcelles St., MONTREAL**

# Why this bank should be YOUR BANK . . .



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A bank for savings, for business, farming and personal loans, for travel funds, for credit and transfer operations, for import and export transactions, for financing domestic and foreign trade.

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British Made of Plastic Material Throughout . . . No Metal Anywhere.

## A New-Type Inhaler

A more hygienic and more convenient means of administering inhalations of amphetamine is now available. It is in the Karsodrine Inhaler—a highly active local volatile vasocanstrictor and anodyne. The Karsodrine Inhaler is of moulded plastic material, with no metal parts, and with only one cap to remove.

Karsodrine affords immediate and prolonged contraction of congested nasal mucosa with local analgesic action. It is thus a valuable form of treatment at the onset of head colds, in cases of sinusitis, rhinitis, nasal catarrh, etc.

Karsodrine is a British production throughout and is obtainable from all druggists in the Dominion at the reasonable price of 50c complete.

### FORMULA FOR MEDICATION IN THE KARSODRINE INHALER

R B-Phenylisopropylamine (amphetamine) 0.3300 gm.; Cineol 0.0929 gm.; Citronella Oil 0.0266 gm.; Methyl-oxybenzoate 0.0232 gm.; Cedar Wood Oil 0.0047 gm.; Menthol 0.0159 gm.; Oil Eucalypt. 0.0598 gm.

Manufactured by  
E. G. H. LABORATORIES LTD.  
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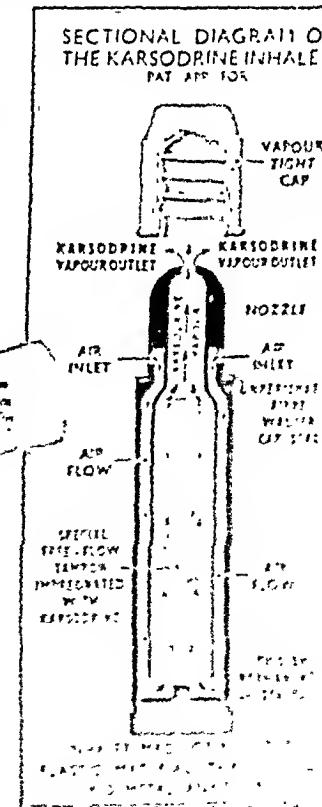


### CLINICAL SAMPLES

Original, full-size Karsodrine Inhalers are available to the medical profession for personal and for patient use. Please address your request to—

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SECTIONAL DIAGRAM OF THE KARSODRINE INHALER



# When every minute counts

SUDDENLY ... often without warning ...there is the screech of brakes...the concluding crash. Another of the 1,355,000 odd motor accidents occurring annually in the United States has taken place.



# Dohme's 'LYOVAC' NORMAL HUMAN PLASMA

## Stable, Stable, Practical



### HOW SUPPLIED:

'Lyovac' Normal Human Plasma is supplied in a package containing one ampoule-vial to yield 250 cc. of plasma when restored to its original volume, together with distilled water, connecting needle, and air filter. Equipment for intravenous injection is separately packaged.



IN 1940 over 25% of the 35,000 fatal auto accidents were the result of excess speed caused by the desire to save time.

But the *really* important minutes usually come *after* such disasters, because shock requires treatment immediately. By the time an accident victim can be brought to the hospital for a transfusion, it is often too late.

**BUT TODAY**—Sharp & Dohme's new 'Lyovac' Normal Human Plasma permits every physician and hospital to quickly administer transfusions at the scene of the disaster because it is stable, practical and portable.

1. With 'Lyovac' Normal Human Plasma no typing or cross matching is necessary.
2. Restoration to fluid state is simple and rapid.
3. Every physician and hospital may keep a supply of 'Lyovac' Normal Human Plasma on hand for this dehydrated plasma retains its therapeutic value and remains stable for at least five years.
4. When restored, the proteins, coagulating elements, specific and non-specific antibodies and complement are essentially the same as that of the original, fresh plasma.

With the exception of formed elements, 250 cc. of restored plasma (one 'Lyovac' unit) is approximately equivalent to 500 cc. of fresh whole blood.

'Lyovac' Normal Human Plasma meets all the requirements of the National Institute of Health and has been accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

**'LYOVAC'**

## NORMAL HUMAN PLASMA

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## GENERAL PRACTITIONER

Intensive full time instruction in those subjects which are of particular interest to the physician in general practice. The course covers all branches of Medicine and Surgery.

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*Acting Honorary Secretaries (war-time)*

# THE STANDARD IRON THERAPY

## FESOFOR TABLETS

### THE STANDARD IRON THERAPY

**FORMULA:** Each Fesofor Tablet contains three grams ferrous sulfate encapsulated—approximately equivalent to five grams ferrous sulfate, U.S.P.—with a special vehicle and coating to prevent oxidation and to promote disintegration.

**INDICATIONS:** Fesofor Tablets are the standard iron therapy for iron-deficiency anemias. These anemias complicate almost every infectious condition. They accompany malnutrition and insufficiency of iron in the diet and follow acute hemorrhage and chronic blood loss. Because of the demands of pregnancy and menstruation, their incidence in women is especially high.

**SPECIFIC THERAPY:** "Shotgun" preparations have little place in the treatment of iron-deficiency anemia. Iron alone is specific. Moreover, the cost of mixtures containing copper, liver, vitamins, etc., in addition to iron, is necessarily high and makes adequate treatment too expensive for the average patient.



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**ADVANTAGES:**

1. Optimal hemoglobin regeneration with 3 to 5 tablets daily
2. The gastric distress associated with other forms of iron therapy is reduced to a minimum. No blackening of teeth; no unpleasant aftertaste.
3. Fesofor Tablets are one of the least expensive forms of iron therapy.

**ADMINISTRATION:** One tablet, three to four times daily, after meals and upon retiring. (In severe iron-deficiency states, larger dosage may be necessary.) Any gastric distress may be almost completely obviated by giving one tablet the first day, two the second, etc., until the full dosage is reached.

**AVAILABLE:** In Bottles of 100 and 1000 Tablets.



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# FESOFOR TABLETS

Canadian Distributors: The Leeming Mills Company, Ltd., Montreal

# HANOVIA SUPER "S" ALPINE ULTRAVIOLET LAMP

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DOES AN EXCELLENT  
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The Hanovia Super "S" Alpine Lamp produces the kind of results that please both the patient and the doctor. One of its features is a ten step intensity regulation by unique control.



## WINS THE CONFIDENCE OF YOUR PATIENTS

### HAS A WIDE RANGE OF CLINICAL USEFULNESS

**Skin Diseases:** Ultra-violet radiation acts specifically on lupus vulgaris and often has a beneficial effect on such conditions as acne vulgaris, eczema, psoriasis, pityriasis rosea and indolent ulcers.

**Pregnant and Nursing Mothers:** Prenatal irradiation of the mother, and also irradiation of the nursing mother, have a definite preventive influence on rickets.

**Tuberculosis:** Irradiation is of distinct value for patients suffering from tuberculosis of the bones, articulations, peritoneum, intestine, larynx and lymph nodes, or from tuberculous sinuses.

**Surgery:** Sluggish wounds that do not heal or are abnormally slow in healing may respond favorably to local or general irradiation.

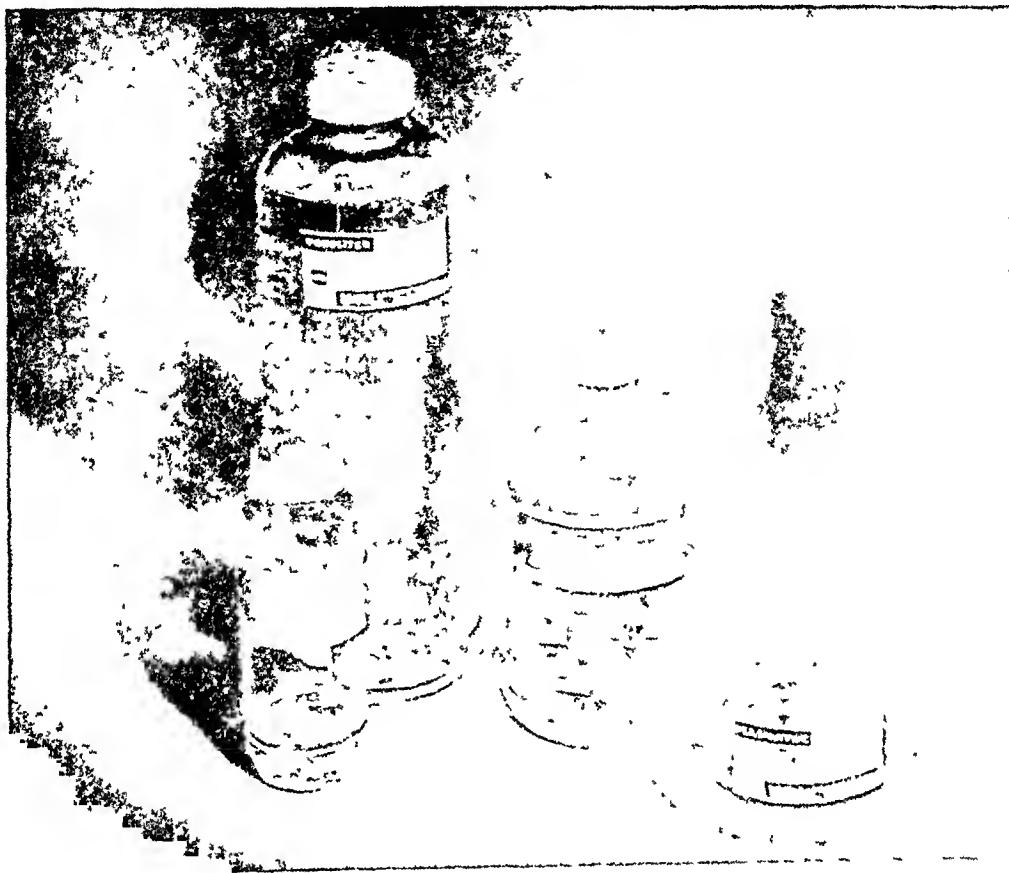
**Care of Infants and Children:** The prophylactic and curative effects of ultra-violet radiation on rickets, infantile tetany or spasmodophilia, and osteomalacia are well known.

**Other Applications:** As an adjuvant in the treatment of secondary anemia, irradiation merits consideration. Also exposure of the lesions of erysipelas and a wide area of surrounding tissue has been shown to have a favorable effect.

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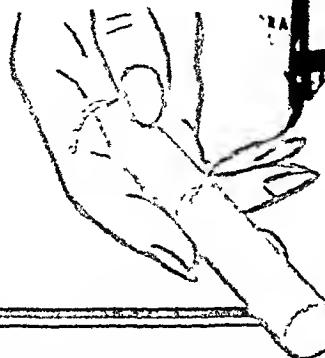
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# When you examine **TAMPAX** please note...

## POINT NO. 3: HOW GENTLE ITS CONTACT WITH THE VAGINAL EPITHELIUM

Fine surgical cotton forms the Tampax tampon—the kind a surgeon might use for a surgical dressing. Its contact with the resilient stratified squamous epithelium of the vaginal canal—ever protectingly moistened by its own transudate and by uterine secretion—is altogether gentle and non-irritant.

Yet its superior absorbency affords a safe margin of protection without bulky packing—compression of the tampon permitting easy insertion, and flat expansion conforming it to the vaginal cross-section. Indeed, so comfortable is Tampax *in situ*, when properly placed high in the vaginal vault, that the user is hardly aware of its presence.

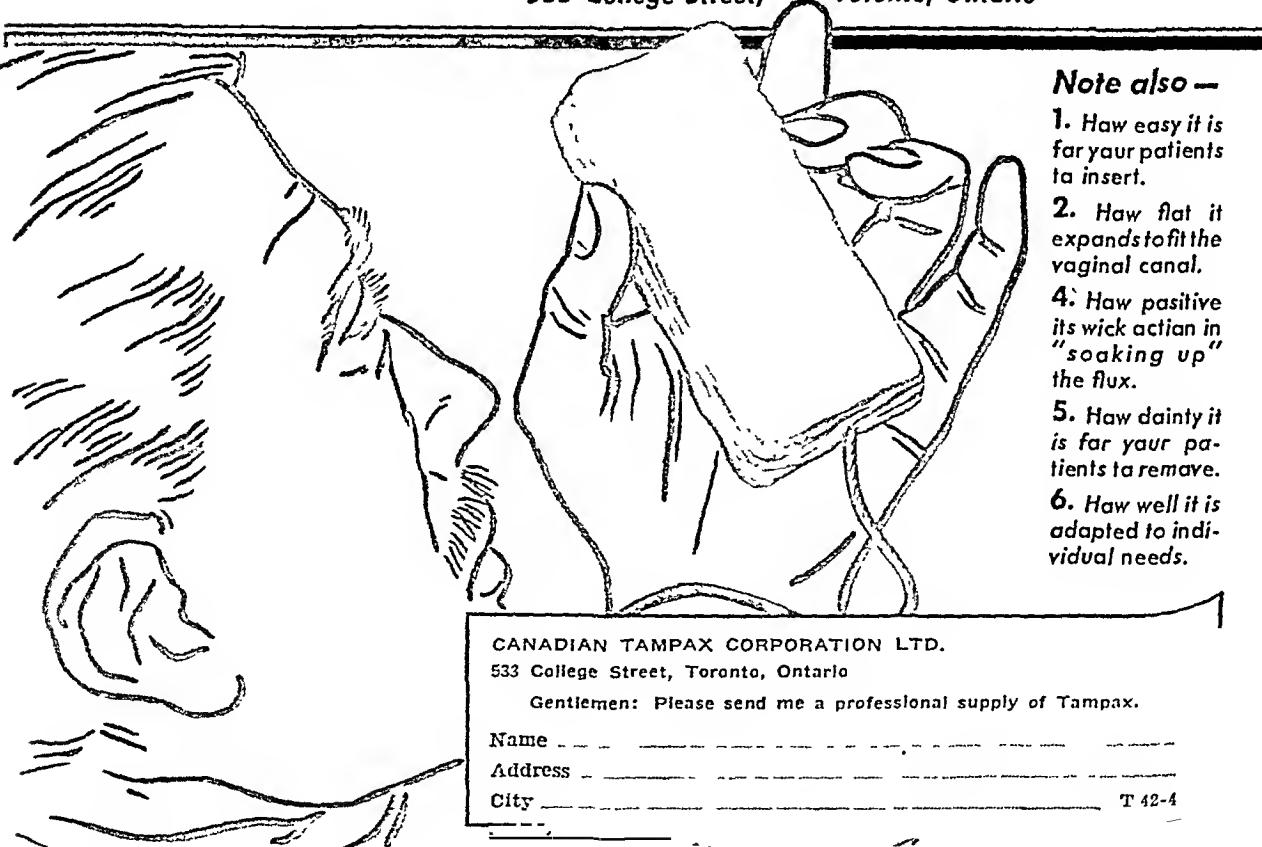
Designed by a physician, Tampax is supplied in three sizes (Super, Regular, and Junior) to meet individual requirements. Its cross-fibre stitching precludes the possibility of disintegration, and its positive "wick" action prevents any blocking of the flow.

The comfort, convenience, and freedom it affords your patients can reflect your own judgment as to the hygienic superiority of this internal form of menstrual protection.

Have you examined Tampax recently? Professional samples on request!

**CANADIAN TAMPAX CORPORATION LTD.,**

533 College Street, Toronto, Ontario



### Note also—

1. How easy it is for your patients to insert.
2. How flat it expands to fit the vaginal canal.
4. How positive its wick action in "soaking up" the flux.
5. How daintily it is for your patients to remove.
6. How well it is adapted to individual needs.

